

**** WARNING ** WARNING ** WARNING ** WARNING ****
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Note: Addenda information is NOT included with the electronic documents available via electronic file transfer. Only bidder or non-bidder package holders listed with the Caltrans Plans and Bid Documents section as described above will receive addenda information.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS
FOR CONSTRUCTION ON STATE HIGHWAY IN
SAN DIEGO COUNTY IN CHULA VISTA AND NATIONAL CITY FROM THE E STREET
OVERCROSSING TO 0.1 km NORTH OF SWEETWATER RIVER BRIDGE

DISTRICT 11, ROUTE 5

**For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 1999, and Labor
Surcharge and Equipment Rental Rates.**

CONTRACT NO. 11-0479K4

11-SD-5-13.8/15.1

Federal Aid Project
CML-6066(034)E

Bids Open: August 23, 2001
Dated: July 23, 2001

OSD

IMPORTANT SPECIAL NOTICES

- The Special Provisions for Federal-aid projects (with and without DBE goals) have been revised to incorporate changes made by new regulations governing the DBE Program (49 CFR Part 26).

Sections 2 and 5 incorporate the changes. Bidders should read these sections to become familiar with them. Attention is directed to the following significant changes:

Section 2, "Disadvantaged Business Enterprise (DBE)" revises the counting of participation by DBE primes, and the counting of trucking performed by DBE firms. The section also revises the information that must be submitted to the Department in order to receive credit for trucking.

Section 2, "Submission of DBE Information" revises the information required to be submitted to the Department to receive credit toward the DBE goal. It also revises the criteria to demonstrate good faith efforts.

Section 5, "Subcontractor and DBE Records" revises the information required to be reported at the end of the project, and information related to trucking that must be submitted throughout the project.

Section 5, "DBE Certification Status" adds new reporting requirements related to DBE certification.

Section 5, "Subcontracting" describes the efforts that must be made in the event a DBE subcontractor is terminated or fails to complete its work for any reason.

Section 5, "Prompt Progress Payment to Subcontractors" requires prompt payment to all subcontractors.

Section 5, "Prompt Payment of Withheld Funds to Subcontractors" requires the prompt payment of retention to all subcontractors.

- **Payment Bonds**
Attention is directed to Section 5 of the Special Provisions, regarding contract bonds. The payment bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of the contract.
- Attention is directed to Section 11-2, "Portland Cement Concrete," of these Special Provisions which contains Section 90, "Portland Cement Concrete," of the Standard Specifications.
- Attention is directed to "Miscellaneous Metal," in Section 8-1, "Miscellaneous," of these Special Provisions for new requirements for miscellaneous metal.
- Attention is directed to Section 3, "Award and Execution of Contract," of the special provisions for special requirements for the time allowed for return of documents by the successful bidder.
- Attention is directed to Section 4, "Beginning of Work, Time of Completion and Liquidated Damages," of the special provisions for special requirements for beginning of work.

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STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

| | |
|----------|---|
| A10A | Abbreviations |
| A10B | Symbols |
| A20A | Pavement Markers and Traffic Lines, Typical Details |
| A62A | Excavation and Backfill - Miscellaneous Details |
| A62B | Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall |
| A62C | Limits of Payment for Excavation and Backfill - Bridge |
| A73B | Markers |
| A76A | Concrete Barrier Type 60 |
| A85 | Chain Link Fence |
| A87 | Curbs, Dikes and Driveways |
| A88A | Curb Ramp Details |
| D73 | Drainage Inlets |
| D77B | Bicycle Proof Grate Details |
| H1 | Planting and Irrigation - Abbreviations |
| H2 | Planting and Irrigation - Symbols |
| H6 | Planting and Irrigation Details |
| H7 | Planting and Irrigation Details |
| T1A | Temporary Crash Cushion, Sand Filled (Unidirectional) |
| RSP T2 | Temporary Crash Cushion, Sand Filled (Shoulder Installations) |
| T3 | Temporary Railing (Type K) |
| T4 | Temporary Traffic Screen |
| T5 | Temporary Terminal Section (Type K) |
| T10 | Traffic Control System for Lane Closure On Freeways and Expressways |
| T14 | Traffic Control System for Ramp Closure |
| B0-1 | Bridge Details |
| RSP B0-3 | Bridge Details |
| B0-5 | Bridge Details |
| B0-13 | Bridge Details |
| B2-6 | Pile Details-Class 400C and Class 625C |
| RSP B3-1 | Retaining Wall Type 1 - H=1200 Through 9100 mm |
| RSP B3-7 | Retaining Wall Type 5 |
| RSP B3-8 | Retaining Wall Details No. 1 |
| B3-9 | Retaining Wall Details No. 2 |
| B6-21 | Joint Seals (Maximum Movement Rating = 50 mm) |
| B7-1 | Box Girder Details |
| B8-5 | Cast-in-Place Prestressed Girder Details |
| RS1 | Roadside Signs, Typical Installation Details No. 1 |
| RS2 | Roadside Signs - Wood Post, Typical Installation Details No. 2 |
| RS4 | Roadside Signs, Typical Installation Details No. 4 |
| ES-1A | Signal, Lighting and Electrical Systems - Symbols and Abbreviations |
| ES-1B | Signal, Lighting and Electrical Systems - Symbols and Abbreviations |
| ES-4A | Signal, Lighting and Electrical Systems - Signal Heads and Mountings |
| ES-5A | Signal, Lighting and Electrical Systems - Detectors |
| ES-5B | Signal, Lighting and Electrical Systems - Detectors |
| ES-5E | Signal, Lighting and Electrical Systems - Detectors |

| | |
|-----------|--|
| RSP ES-6A | Lighting Standards - Types 15, 21 and 22 |
| ES-6E | Lighting Standards - Types 30 and 31 |
| RSP ES-6F | Lighting Standards - Type 30 and 31 Base Plate Details |
| ES-7B | Signal and Lighting Standards - Type 1 Standards and Equipment Numbering |
| RSP ES-7D | Signal and Lighting Standards - Case 2 Arm Loading, Wind Velocity = 129 km/h, Arm Lengths 4.6 m to 9.1 m |
| RSP ES-7E | Signal and Lighting Standards - Case 3 Arm Loading, Wind Velocity = 129 km/h, Arm Lengths 4.6 m to 13.7 m |
| ES-7F | Signal and Lighting Standards - Case 4 Arm Loading, Wind Velocity = 129 km/h, Arm Lengths 7.6 m to 13.7 m |
| ES-7G | Signal and Lighting Standards - Case 5 Arm Loading, Wind Velocity = 129 km/h, Arm Lengths 15.2 m to 16.8 m |
| ES-7M | Signal and Lighting Standards - Details No. 1 |
| ES-10 | Signal, Lighting and Electrical Systems - Isolux Diagrams |
| ES-11 | Signal, Lighting and Electrical Systems - Foundation Installations |
| ES-13A | Signal, Lighting and Electrical Systems - Splicing Details |

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 11-0479K4

11-SD-5-13.8/15.1

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION
ON STATE HIGHWAY IN SAN DIEGO COUNTY IN CHULA VISTA AND NATIONAL CITY FROM THE
E STREET OVERCROSSING TO 0.1 km NORTH OF SWEETWATER RIVER BRIDGE**

will be received at the Department of Transportation, 3347 Michelson Drive, Suite 100, Irvine, CA 92612-1692, until 2 o'clock p.m. on August 23, 2001, at which time they will be publicly opened and read in Room C - 1116 at the same address.

Proposal forms for this work are included in a separate book entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT FOR
CONSTRUCTION ON STATE HIGHWAY IN SAN DIEGO COUNTY IN CHULA VISTA AND NATIONAL CITY
FROM THE E STREET OVERCROSSING TO 0.1 km NORTH OF SWEETWATER RIVER BRIDGE**

General work description: Construct a bike path, retaining wall and concrete barrier.

This project has a goal of 15 percent disadvantaged business enterprise (DBE) participation.
No prebid meeting is scheduled for this project.

**THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE
TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE
TRANSPORTATION EFFICIENCY ACT OF 1991.**

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or one of the following Class C licenses: C-8.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

The Caltrans District 11 Office is located at 2829 Juan Street, San Diego, CA 92110. The mailing address is P.O. Box 85406, San Diego, CA 92186-5406, E-mail address of the Duty Senior is: Duty_Senior_Const_District11@dot.ca.gov, or by fax at (619) 688-6988. The District 11 Duty Senior telephone number is (619) 688-6635.

The Website address for posting of questions and responses is: www.dot.ca.gov/dist11/construc/

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, MS #26, Transportation Building, 1120 N Street, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications and Standard Plans are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Contract No. 11-0479K4

Cross sections for this project are available at the office of the District Director of Transportation of the district in which the work is situated in electronic copy format.

The successful bidder shall furnish a payment bond and a performance bond.

The Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated July 23, 2001

AFL

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)
11-0479K4

| Item | Item Code | Item | Unit of Measure | Estimated Quantity |
|-----------|-----------|--|-----------------|--------------------|
| 1 | 070012 | PROGRESS SCHEDULE (CRITICAL PATH METHOD) | LS | LUMP SUM |
| 2 | 021813 | TEMPORARY SOUND WALL | M | 690 |
| 3 | 021814 | TEMPORARY FENCE (TYPE ESA) | M | 1210 |
| 4 (S) | 074023 | TEMPORARY EROSION CONTROL | HA | .9 |
| 5 | 074028 | TEMPORARY FIBER ROLL | M | 2330 |
| 6 | 021815 | TEMPORARY GRAVEL BAG | EA | 100 |
| 7 | 021816 | TEMPORARY CONCRETE WASHOUT | EA | 2 |
| 8 | 021817 | TEMPORARY CONSTRUCTION ENTRANCE | EA | 2 |
| 9 | 120090 | CONSTRUCTION AREA SIGNS | LS | LUMP SUM |
| 10 (S) | 120100 | TRAFFIC CONTROL SYSTEM | LS | LUMP SUM |
| 11 | 021818 | TRAFFIC PLASTIC DRUMS | EA | 25 |
| 12 (S) | 121161 | TEMPORARY TERMINAL SECTION (TYPE K) | EA | 2 |
| 13 | 128650 | PORTABLE CHANGEABLE MESSAGE SIGN | EA | 2 |
| 14 | 129000 | TEMPORARY RAILING (TYPE K) | M | 470 |
| 15 | 129100 | TEMPORARY CRASH CUSHION MODULE | EA | 14 |
| 16 | 150605 | REMOVE FENCE | M | 18 |
| 17 | 150742 | REMOVE ROADSIDE SIGN | EA | 5 |
| 18 | 150771 | REMOVE ASPHALT CONCRETE DIKE | M | 360 |
| 19 | 150844 | REMOVE SLOPE PAVING | M3 | 48 |
| 20 | 152379 | RELOCATE FENCE | M | 270 |

| Item | Item Code | Item | Unit of Measure | Estimated Quantity |
|-----------|-----------|---|-----------------|--------------------|
| 21 | 152390 | RELOCATE ROADSIDE SIGN | EA | 2 |
| 22 | 152432 | ADJUST MANHOLE | EA | 2 |
| 23 | 153221 | REMOVE CONCRETE BARRIER | M | 130 |
| 24 | 160101 | CLEARING AND GRUBBING | LS | LUMP SUM |
| 25 | 170101 | DEVELOP WATER SUPPLY | LS | LUMP SUM |
| 26 | 190101 | ROADWAY EXCAVATION | M3 | 1370 |
| 27 (F) | 192003 | STRUCTURE EXCAVATION (BRIDGE) | M3 | 46 |
| 28 (F) | 192008 | STRUCTURE EXCAVATION (TYPE A) | M3 | 330 |
| 29 (F) | 192037 | STRUCTURE EXCAVATION (RETAINING WALL) | M3 | 3068 |
| 30 (F) | 193003 | STRUCTURE BACKFILL (BRIDGE) | M3 | 45 |
| 31 (F) | 193013 | STRUCTURE BACKFILL (RETAINING WALL) | M3 | 3363 |
| 32 (F) | 048637 | STRUCTURE BACKFILL (LIGHT WEIGHT, RETAINING WALL) | M3 | 657 |
| 33 (F) | 193031 | PERVIOUS BACKFILL MATERIAL (RETAINING WALL) | M3 | 333 |
| 34 (S) | 200001 | HIGHWAY PLANTING | LS | LUMP SUM |
| 35 (S) | 021909 | IMPORTED TOPSOIL (EROSION CONTROL) | M3 | 160 |
| 36 (S) | 021910 | BONDED FIBER MATRIX (EROSION CONTROL) | KG | 2070 |
| 37 (S) | 203045 | PURE LIVE SEED (EROSION CONTROL) | KG | 10 |
| 38 (S) | 203056 | COMMERCIAL FERTILIZER (EROSION CONTROL) | KG | 23 |
| 39 (S) | 204099 | PLANT ESTABLISHMENT WORK | LS | LUMP SUM |
| 40 (S) | 208000 | IRRIGATION SYSTEM | LS | LUMP SUM |

| Item | Item Code | Item | Unit of Measure | Estimated Quantity |
|-------------|-----------|---|-----------------|--------------------|
| 41 (S) | 208699 | 200 MM CONDUIT | M | 3 |
| 42 (S) | 208909 | EXTEND 200 MM CONDUIT | M | 3 |
| 43 | 260201 | CLASS 2 AGGREGATE BASE | M3 | 500 |
| 44 | 390102 | ASPHALT CONCRETE (TYPE A) | TONN | 760 |
| 45 | 394001 | PLACE ASPHALT CONCRETE DIKE | M | 480 |
| 46 | 490774 | FURNISH PILING (CLASS 625C) (ALTERNATIVE V) | M | 441 |
| 47 (S) | 490775 | DRIVE PILE (CLASS 625C) (ALTERNATIVE V) | EA | 24 |
| 48 | 491014 | FURNISH PILING (CLASS 400C) (ALTERNATIVE V) | M | 270 |
| 49 (S) | 491015 | DRIVE PILE (CLASS 400C) (ALTERNATIVE V) | EA | 13 |
| 50 (S) | 500001 | PRESTRESSING CAST-IN-PLACE CONCRETE | LS | LUMP SUM |
| 51 | 510000 | SEAL COURSE CONCRETE | M3 | 148 |
| 52 (F) | 510051 | STRUCTURAL CONCRETE, BRIDGE FOOTING | M3 | 68 |
| 53 (F) | 510053 | STRUCTURAL CONCRETE, BRIDGE | M3 | 425 |
| 54 (F) | 510060 | STRUCTURAL CONCRETE, RETAINING WALL | M3 | 11 |
| 55 (F) | 510133 | CLASS 2 CONCRETE (RETAINING WALL) | M3 | 1483 |
| 56 (F) | 510502 | MINOR CONCRETE (MINOR STRUCTURE) | M3 | 2 |
| 57 (F) | 021820 | ARCHITECTURAL TEXTURE | M2 | 1866 |
| 58 (S) | 519144 | JOINT SEAL (MR 50 MM) | M | 8 |
| 59 (S-F) | 520102 | BAR REINFORCING STEEL (BRIDGE) | KG | 62 200 |
| 60 (S-F) | 520103 | BAR REINFORCING STEEL (RETAINING WALL) | KG | 68 748 |

| Item | Item Code | Item | Unit of Measure | Estimated Quantity |
|-------------|-----------|---|-----------------|--------------------|
| 61 (S) | 530100 | SHOTCRETE | M3 | 80 |
| 62 (F) | 562002 | METAL (BARRIER MOUNTED SIGN) | KG | 67 |
| 63 | 566011 | ROADSIDE SIGN - ONE POST | EA | 13 |
| 64 | 568001 | INSTALL SIGN (STRAP AND SADDLE BRACKET METHOD) | EA | 3 |
| 65 (S) | 641132 | 300 MM PLASTIC PIPE | M | 17 |
| 66 (S) | 650069 | 450 MM REINFORCED CONCRETE PIPE | M | 4 |
| 67 (S) | 650476 | 600 MM REINFORCED CONCRETE PIPE (CLASS IV) | M | 5 |
| 68 | 650487 | 1350 MM REINFORCED CONCRETE PIPE (CLASS IV) | M | 7 |
| 69 | 705220 | 300 MM CONCRETE FLARED END SECTION | EA | 2 |
| 70 | 721810 | SLOPE PAVING (CONCRETE) | M3 | 60 |
| 71 (S-F) | 750001 | MISCELLANEOUS IRON AND STEEL | KG | 1052 |
| 72 (S-F) | 750501 | MISCELLANEOUS METAL (BRIDGE) | KG | 247 |
| 73 (S) | 021821 | CHAIN LINK FENCE (TYPE CL-1.2 MODIFIED) | M | 950 |
| 74 (S) | 800389 | CHAIN LINK FENCE (TYPE CL-1.5) | M | 70 |
| 75 (S) | 021822 | CHAIN LINK FENCE (TYPE CL-1.5 MODIFIED, VINYL CLAD, 0.9 M PLASTIC SHRUBBERY INSERT) | M | 930 |
| 76 (S) | 021823 | CHAIN LINK FENCE (TYPE CL-1.8 MODIFIED, VINYL CLAD, 1.8 M PLASTIC SHRUBBERY INSERT) | M | 13 |
| 77 (S-F) | 833000 | METAL RAILING | M | 256 |
| 78 (S) | 839523 | BARRIER POST | EA | 4 |
| 79 | 839701 | CONCRETE BARRIER (TYPE 60) | M | 13 |
| 80 | 021824 | CONCRETE BARRIER (TYPE 60 MODIFIED) | M | 40 |

| Item | Item Code | Item | Unit of Measure | Estimated Quantity |
|-----------|-----------|--------------------------------|-----------------|--------------------|
| 81 | 839703 | CONCRETE BARRIER (TYPE 60C) | M | 500 |
| 82 | 840515 | THERMOPLASTIC PAVEMENT MARKING | M2 | 12 |
| 83 (S) | 840656 | PAINT TRAFFIC STRIPE (2-COAT) | M | 1500 |
| 84 (S) | 860201 | SIGNAL AND LIGHTING | LS | LUMP SUM |
| 85 (S) | 860401 | LIGHTING | LS | LUMP SUM |
| 86 (S) | 999990 | MOBILIZATION | LS | LUMP SUM |

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 11-0479K4

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 1999, of the Department of Transportation insofar as the same may apply, and these special provisions.

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the indented text or table following the term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and shall be used in lieu of the conflicting portions.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, District 11, Construction Duty Senior MS 73, P.O. Box 85406, San Diego, CA. 92186-5400, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.015 FEDERAL LOBBYING RESTRICTIONS

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto.
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company.
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
 - 1. The bidder will meet the goal by performing work with its own forces.
 - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.
 - 3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions.
- E. A DBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work.
- F. DBEs must be certified by either the California Department of Transportation, or by a participating State of California or local agency which certifies in conformance with Title 49, Code of Federal Regulations, Part 26, as of the date of bid opening. It is the Contractor's responsibility to verify that DBEs are certified. Listings of DBEs certified by the Department are available from the following sources:
 - 1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

2. The Department's Electronic Information Bulletin Board Service, which is accessible by modem and is updated weekly. The Bulletin Board may be accessed by first contacting the Department's Business Enterprise Program at Telephone: (916) 227-8937 and obtaining a user identification and password.
3. The Department's web site at <http://www.dot.ca.gov/hq/bep/index.htm>.
4. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.

G. Credit for materials or supplies purchased from DBEs will be as follows:

1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.
3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

H. Credit for DBE trucking companies will be as follows:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

- I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.
- J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 15 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

| | |
|---|--|
| Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10: | Districts 08, 11 and 12: |
| Triaxial Management Services, Inc. - Oakland 1545 Willow Street, 1st Floor Oakland, CA 94607 Telephone - (510) 286-1313 FAX No. - (510) 286-6792 | Triaxial Management Services, Inc. - San Diego 2725 Congress Street, Suite 1-D San Diego, CA 92110 Telephone - (619) 543-5109 FAX No. - (619) 543-5108 |
| Districts 07 and 08; in San Luis Obispo and Santa Barbara Counties in District 05; and in Kern County in District 06: | Districts 01, 02, 03 and 09: |
| Triaxial Management Services, Inc. - Los Angeles 2594 Industry Way, Suite 101 Lynwood, CA 90262 Telephone - (310) 537-6677 FAX No. - (310) 637-0128 | Triaxial Management Services, Inc. - Sacramento 930 Alhambra Blvd., #205 Sacramento, CA 95816 Telephone - (916) 553-4172 FAX No. - (916) 553-4173 |

2-1.02B SUBMISSION OF DBE INFORMATION

The required DBE information shall be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. If the DBE information is not submitted with the bid, the DBE Information form shall be removed from the documents prior to submitting the bid.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation or to provide information to establish that, prior to bidding, the bidder made adequate good faith efforts to do so.

If DBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit DBE information to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening. DBE information sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Failure to submit the required DBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DBE information unless requested to do so by the Department.

The bidder's DBE information shall establish that good faith efforts to meet the DBE goal have been made. To establish good faith efforts, the bidder shall demonstrate that the goal will be met or that, prior to bidding, adequate good faith efforts to meet the goal were made.

Bidders are cautioned that even though their submittal indicates they will meet the stated DBE goal, their submittal should also include their adequate good faith efforts information along with their DBE goal information to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

The bidder's DBE information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a written confirmation from the DBE that it is participating in the contract. A copy of the DBE's quote will serve as written confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The information necessary to establish the bidder's adequate good faith efforts to meet the DBE goal should include:

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder.
- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested.
- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to meet the DBE goal was made available to DBE firms.
- D. The names, addresses and phone numbers of rejected DBE firms, the firms selected for that work, and the reasons for the bidder's choice.
- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs.
- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.
- G. The names of agencies contacted to provide assistance in contacting, recruiting and using DBE firms.
- H. Any additional data to support a demonstration of good faith efforts.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

The contract shall be signed by the successful bidder and shall be received with the contract bonds by the Division of Office Engineer within **4 days**, not including Saturdays, Sundays and legal holidays, after the bidder has received notice that the contract has been awarded. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation, Engineering Service Center, P.O. Box 168041, Sacramento, CA 95816-8041, Attn.: Office Engineer (MS43) - Contracts.

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Sections 8-1.03, "Beginning of Work," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," and 20-4.08, "Plant Establishment Work," of the Standard Specifications and these special provisions.

The Contractor shall begin work within **5** calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

The work (except plant establishment work) shall be diligently prosecuted to completion before the expiration of **375 WORKING DAYS** beginning on the fifth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$550 per day, for each and every calendar day's delay in finishing the work (except plant establishment work) in excess of the number of working days prescribed above.

The Contractor shall diligently prosecute all work (including plant establishment) to completion before the expiration of 495 **WORKING DAYS** beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$250 per day, for each and every calendar day's delay in completing the work in excess of the number of working days prescribed above.

In no case will liquidated damages of more than \$550 per day be assessed.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.01 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Division of Structure Design, the drawings shall be submitted to: Division of Structure Design, Documents Unit, Mail Station 9, 1801 30th Street, Sacramento, CA 95816, Telephone (916) 227-8252.

5-1.011 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

The second paragraph of Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications is amended to read:

- Where the Department has made investigations of site conditions, including subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources, bidders or Contractors may, upon written request, inspect the records of the Department as to those investigations subject to and upon the conditions hereinafter set forth.

Attention is directed to "Differing Site Conditions" of these special provisions regarding physical conditions at the site which may differ from those indicated in "Materials Information," log of test borings or other geotechnical information obtained by the Department's investigation of site conditions.

5-1.012 DIFFERING SITE CONDITIONS

Attention is directed to Section 5-1.116, "Differing Site Conditions," of the Standard Specifications.

During the progress of the work, if subsurface or latent conditions are encountered at the site differing materially from those indicated in the "Materials Information," log of test borings, other geotechnical data obtained by the Department's investigation of subsurface conditions, or an examination of the conditions above ground at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

The Contractor will be allowed 15 days from the notification of the Engineer's determination of whether or not an adjustment of the contract is warranted, in which to file a notice of potential claim in conformance with the provisions of Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications and as specified herein; otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The notice of potential claim shall set forth in what respects the Contractor's position differs from the Engineer's determination and provide any additional information obtained by the Contractor, including but not limited to additional geotechnical data. The notice of potential claim shall be accompanied by the Contractor's certification that the following were made in preparation of the bid: a review of the contract, a review of the "Materials Information," a review of the log of test borings and other records of geotechnical data to the extent they were made available to bidders prior to the opening of bids, and an examination of the conditions above ground at the site. Supplementary information, obtained by the Contractor subsequent to the filing of the notice of potential claim, shall be submitted to the Engineer in an expeditious manner.

5-1.015 LABORATORY

When a reference is made in the specifications to the "Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

5-1.017 CONTRACT BONDS

Attention is directed to Section 3-1.02, "Contract Bonds," of the Standard Specifications and these special provisions.

The payment bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of the contract.

5-1.018 EXCAVATION SAFETY PLANS

Section 5-1.02A, "Trench Excavation Safety Plans," of the Standard Specifications is amended to read:

5-1.02A Excavation Safety Plans

- The Construction Safety Orders of the Division of Occupational Safety and Health shall apply to all excavations. For all excavations 1.5 m or more in depth, the Contractor shall submit to the Engineer a detailed plan showing the design and details of the protective systems to be provided for worker protection from the hazard of caving ground during excavation. The detailed plan shall include any tabulated data and any design calculations used in the preparation of the plan. Excavation shall not begin until the detailed plan has been reviewed and approved by the Engineer.
- Detailed plans of protective systems for which the Construction Safety Orders require design by a registered professional engineer shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California, and shall include the soil classification, soil properties, soil design calculations that demonstrate adequate stability of the protective system, and any other design calculations used in the preparation of the plan.
- No plan shall allow the use of a protective system less effective than that required by the Construction Safety Orders.
- If the detailed plan includes designs of protective systems developed only from the allowable configurations and slopes, or Appendices, contained in the Construction Safety Orders, the plan shall be submitted at least 5 days before the Contractor intends to begin excavation. If the detailed plan includes designs of protective systems developed from tabulated data, or designs for which design by a registered professional engineer is required, the plan shall be submitted at least 3 weeks before the Contractor intends to begin excavation.
- Attention is directed to Section 7-1.01E, "Trench Safety."

The third paragraph of Section 19-1.02, "Preservation of Property," of the Standard Specifications is amended to read:

- In addition to the provisions in Sections 5-1.02, "Plans and Working Drawings," and 5-1.02A, "Excavation Safety Plans," detailed plans of the protective systems for excavations on or affecting railroad property will be reviewed for adequacy of protection provided for railroad facilities, property, and traffic. These plans shall be submitted at least 9 weeks before the Contractor intends to begin excavation requiring the protective systems. Approval by the Engineer of the detailed plans for the protective systems will be contingent upon the plans being satisfactory to the railroad company involved.

5-1.019 COST REDUCTION INCENTIVE

Attention is directed to Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications.

Prior to preparing a cost reduction proposal, the Contractor shall request a meeting with the Engineer to discuss the proposal in concept and to determine the merit of the cost reduction proposal. Items of discussion will also include permit issues, impact on other projects, impact on the project schedule, peer reviews, and review times required by the Department and other agencies.

5-1.02 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM

(GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt State contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The specifications are applicable to all nonexempt State construction contracts and subcontracts of \$5000 or more.

5-1.03 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments, and claim payments as follows:

- A. Unpaid progress payments, payment after acceptance, and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
- B. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in conformance with the provisions in Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
- C. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments, and extra work payments shall be 10 percent per annum.
- D. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.031 FINAL PAYMENT AND CLAIMS

Attention is directed to Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications.

If the Contractor files a timely written statement of claims in response to the proposed final estimate, the District that administers the contract will submit a claim position letter to the Contractor by hand delivery or deposit in the U.S. mail within 135 days of acceptance of the contract. The claim position letter will delineate the District's position on the Contractor's claims. If the Contractor disagrees with the claim position letter, the Contractor shall submit a written notification of its disagreement to be received by the District not later than 15 days after the Contractor's receipt of the claim position letter. The written notification of disagreement shall set forth the basis for the Contractor's disagreement and be submitted to the office designated in the claim position letter. The Contractor's failure to provide a timely, written notification of disagreement shall constitute the Contractor's acceptance and agreement with the determinations provided in the claim position letter and with final payment pursuant to the claim position letter.

If the Contractor files a timely notification of disagreement with the District claim position letter, the board of review designated by the District Director to review claims that remain in dispute will meet with the Contractor within 45 days after receipt by the District of the notification of disagreement. Attendance by the Contractor at the board of review meeting shall be mandatory.

If the District fails to submit a claim position letter to the Contractor within 135 days after the acceptance of the contract and the Contractor has claims that remain in dispute, the Contractor may request a meeting with the board of review designated by the District Director to review claims that remain in dispute. The Contractor's request for a meeting shall identify the claims that remain in dispute. If the Contractor files a request for a meeting, the board of review will meet with the Contractor within 45 days after the District receives the request for the meeting. Attendance by the Contractor at the District Director's board of review meeting shall be mandatory.

Failure of the Contractor to file a timely written statement of claims in response to the proposed final estimate, or to file a timely notification of disagreement with the District claim position letter, or to attend the District Director's board of review meeting shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract and shall be a bar to arbitration in conformance with the requirements in Section 10240.2 of the California Public Contract Code.

5-1.04 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:
 - 1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.

2. Excavations less than 0.3-m deep.
 3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
 4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
 6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles.—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1999 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

| Approach Speed of Public Traffic (Posted Limit) (Kilometers Per Hour) | Work Areas |
|--|--|
| Over 72 (45 Miles Per Hour) | Within 1.8 m of a traffic lane but not on a traffic lane |
| 56 to 72 (35 to 45 Miles Per Hour) | Within 0.9-m of a traffic lane but not on a traffic lane |

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.05 SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations, and to California Public Contract Code Section 10295.5.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with California Public Contract Code Section 10295.5.

The requirements of this section shall apply to materials furnished for the project, except for acquisition of materials in conformance with the provisions in Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.07 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California.

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product shall operate accurately in the manner in which the product was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.075 BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coatings that protect or enhance the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

5-1.08 SUBCONTRACTOR AND DBE RECORDS

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit claimed toward DBE participation conforms with Section 2-1.02, "Disadvantaged Business Enterprise," of these special provisions.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

5-1.083 DBE CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.09 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, and Section 2, "Proposal Requirements and Conditions," and Section 3, "Award and Execution of Contract," of these special provisions.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

<http://www.dir.ca.gov/DLSE/Debar.html>.

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

The requirement in Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these special provisions that DBEs must be certified on the date bids are opened does not apply to DBE substitutions after award of the contract.

5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

5-1.11 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship is to maintain a cooperative communication and to mutually resolve conflicts at the lowest responsible management level.

The Contractor may request the formation of a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering Workshop," selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties. If agreed to by the parties, additional "Partnering Workshops" will be conducted as needed throughout the life of the contract.

The costs involved in providing the "Partnering Workshop" facilitator and workshop site will be borne equally by the State and the Contractor. The division of cost will be made by determining the cost in providing the "Partnering Workshop" facilitator and workshop site in conformance with the provisions in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services," of the Standard Specifications, and paying to the Contractor one-half of that cost, except no markups will be allowed.

All other costs associated with "Partnering Workshops" will be borne separately by the party incurring the costs, such as wages and travel expenses, and no additional compensation will be allowed therefor.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.12 ENVIRONMENTALLY SENSITIVE AREA (ESA)

The Contractor's attention is directed to the areas designated on the plans as "Environmentally Sensitive Area," and to certain State and Federal regulations which may pertain to such areas. Work area limits shall be clearly marked by placing 2.4 m temporary sound wall(s) or a temporary fence along ESA areas prior to performing any work. These areas shall be completely avoided by all parties involved in any work activity in connection with the performance of this contract. The location of the sound wall(s) and fences shown on the plans are approximate and the exact location will be established by the Engineer in the field.

Attention is directed to "Temporary Sound Wall" and "Temporary Fence (Type ESA)" of these special provisions.

5-1.13 BIOLOGY

A Biologist will be provided by the State for this project.

The Contractor shall notify the Engineer in writing 5 days in advance, to the initiation of work in the general vicinity of the Bay Shore Bike Path project.

Construction activities and the project area will be monitored by a qualified biologist who will report every 3 months, compliance with the terms and conditions within the permit from US Fish and Wildlife Service.

If in the opinion of the Engineer, the Contractor's operations are delayed or interfered with, the State will compensate the Contractor for such delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.14 AREAS FOR CONTRACTOR'S USE

Attention is directed to the provisions in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

No State-owned parcels adjacent to the right of way are available for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials, or for other purposes.

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for damage to or loss of materials or equipment located within such areas.

5-1.15 PAYMENTS

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

- | | |
|---|-------------|
| A. Clearing and Grubbing | \$ 4,000.00 |
| B. Develop Water Supply | \$ 5,000.00 |
| C. Progress Schedule (Critical Path Method) | \$20,000.00 |

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

- A. Bar Reinforcing Steel
- B. Railings
- C. Fences

5-1.16 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

The noise level from the Contractor's operations, between the hours of 7:00 p.m. and 7:00 a.m., shall not exceed 86 dbA at a distance of 15 m. This requirement shall not relieve the Contractor from responsibility for complying with local ordinances regulating noise level outside the limits of the State right of way.

The noise level requirement specified herein shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.17 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME

A portion of this project is located within the jurisdiction of the California Department of Fish and Game. An agreement regarding a stream or lake has been entered into by the Department of Transportation and the Department of Fish and Game. The Contractor shall be fully informed of the requirements of this agreement as well as rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone (916) 654-4490, and are available for inspection at the office of the District Director of Transportation at 2829 Juan Street, San Diego, California.

It is unlawful for any person to divert, obstruct or change the natural flow of the bed, channel or bank of a stream, river or lake without first notifying the Department of Fish and Game, unless the project or activity is noticed and constructed in conformance with conditions imposed under Fish and Game Code Section 1601.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Modifications to the agreement between the Department of Transportation and the Department of Fish and Game which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Department of Fish and Game for their consideration.

When the Contractor is notified by the Engineer that a modification to the agreement is under consideration, no work shall be performed which is inconsistent with the original agreement or proposed modification until the Departments take action on the proposed modifications. Compensation for delay will be determined in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Modifications to any agreement between the Department of Transportation and the Department of Fish and Game will be fully binding on the Contractor. The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.18 RELATIONS WITH CALIFORNIA COASTAL COMMISSION

The location of the project is within the jurisdiction of the California Coastal Commission. Coastal Development Permit No. 6-96-54-A1 has been issued covering work to be performed under this contract. The Contractor shall fully inform himself of all rules, regulations and conditions that may govern his operations in said area and shall conduct his work accordingly.

Copies of the permit may be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, P.O. Box 942874, Sacramento, California 94274-0001, Telephone No. (916) 654-4490, and are available for inspection at the office of the District Director of Transportation at 2829 Juan Street, San Diego, California.

Attention is directed to Sections 7-1.11, "Preservation of Property," and 7-1.12, "Responsibility for Damage," of the Standard Specifications.

Any changes proposed by the Contractor shall be submitted to the Engineer for transmittal to the California Coastal Commission for their approval. Changes shall not be implemented until approved in writing by the California Coastal Commission.

When the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed which is inconsistent with the proposed modification until the Departments take action on the proposed modifications. Compensation for delay will be determined in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days during which the Contractor's operations are restricted in the floodway by the requirements of this section, shall be considered to be nonworking days if these restrictions cause a delay in the current controlling operation or operations.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.19 RELATIONS WITH U.S. FISH AND WILDLIFE SERVICE

A portion of this project is located within the jurisdiction of the U.S. Fish and Wildlife Service. An agreement regarding a stream or lake has been entered into by the Department of Transportation and the U.S. Fish and Wildlife Service. The Contractor shall be fully informed of the requirements of this agreement as well as rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

The Contractor shall notify all personnel (including subcontractors), in writing, that domestic pets (dogs and cats, etc.) are prohibited at the job site.

The Contractor shall, on a daily basis, during active construction collect and remove all trash and food from the project site.

Vehicles and all other construction-related equipment shall follow a pre-designated route to the construction area and shall avoid salt marsh habitat. No vehicular or foot traffic will be allowed outside of the designated construction zone.

All populations of Salt Marsh Bird's Beak shall be flagged and protected by temporary fiber rolls for the duration of the construction.

Temporary fiber rolls and other sediment control devices shall be installed to prevent erosion or deposition from occurring in the marsh. Any other necessary erosion and sedimentation control measures shall be implemented to prevent additional sedimentation of wetland areas.

The Contractor shall not engage in construction activities within 53 meters of any freshwater or salt water marsh habitat, except "Water Pollution Control" during the period from March 15 and September 15 in any calendar year. "Water Pollution Control" construction activities performed within this period shall be limited to foot traffic.

The Contractor's attention is directed to "Water Pollution Control" of these special provisions.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone 916-654-4490, and are available for inspection from the District Construction Design Liaison Telephone No. (619) 688-6635 at the office of the District Director of Transportation at 2829 Juan Street, San Diego, California 92110.

It is unlawful for any person to divert, obstruct or change the natural flow of the bed, channel or bank of a stream, river or lake without first notifying U.S. Fish and Wildlife Service.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Modifications to the agreement between the Department of Transportation and the U.S. Fish and Wildlife Service which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the U.S. Fish and Wildlife Service for their consideration.

When the Contractor is notified by the Engineer that a modification to the agreement is under consideration, no work shall be performed which is inconsistent with the original agreement or proposed modification until the Department of Transportation and U.S. Fish and Wildlife Service take action on the proposed modifications. Compensation for delay will be determined in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Modifications to any agreement between the U.S. Fish and Wildlife Service and Department of Transportation will be fully binding on the Contractor. The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.20 RELATIONS WITH U.S. ARMY CORPS OF ENGINEERS

The location of the project is within an area controlled by the U.S. Army Corps of Engineers. The U.S. Army Corps of Engineers has issued a Nationwide 404 permit Number 25 covering work to be performed under this contract. The Contractor shall be fully informed of rules, regulations, and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the permit may be obtained at the Department of Transportation, Plans and Bid Documents Section, MS 26, 1120 N Street, Room 200, Sacramento, CA 95814, Telephone (916) 654-4490, and are available for inspection through the District Construction Design Liaison, Telephone No. (619) 688-6635 at the office of the District Director of Transportation at 2829 Juan Street, San Diego, CA 92110.

Attention is directed to Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

The Contractor's attention is directed to the following conditions which are among those established by the U.S. Army Corps of Engineers in their permit for this project:

No temporary fill will be allowed in the Paradise Creek or Paradise Marsh. Construction of temporary structures will be allowed. Temporary piles will be allowed under the following condition: All temporary pile material and installation must comply with the water quality standards of these special provisions.

Changes in the above listed conditions proposed by the Contractor shall be submitted to the Engineer for transmittal to the U.S. Army Corps of Engineers for their approval. Changes shall not be implemented until approved in writing by the U.S. Army Corps of Engineers.

When the Contractor is notified by the Engineer that a modification to the permit is under consideration, no work will be allowed which is inconsistent with the proposed modification until the Department of Transportation and U.S. Army Corps of Engineers take action on the proposed modifications. Compensation for delay will be determined in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the United States Standard Measures which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use, the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details, the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The plans and working drawings shall be submitted at least 7 days before the Contractor intends to begin the work involved.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL FASTENERS

ASTM Designation: A 325M

| METRIC SIZE SHOWN ON THE PLANS mm x thread pitch | SIZE TO BE SUBSTITUTED inch |
|--|---------------------------------------|
| M16 x 2 | 5/8 |
| M20 x 2.5 | 3/4 |
| M22 x 2.5 | 7/8 |
| M24 x 3 | 1 |
| M27 x 3 | 1-1/8 |
| M30 x 3.5 | 1-1/4 |
| M36 x 4 | 1-1/2 |

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT

ASTM Designation: A 82

| METRIC SIZE SHOWN ON THE PLANS ² mm | SIZE TO BE SUBSTITUTED ² inch x 100 |
|--|--|
| MW9 | W1.4 |
| MW10 | W1.6 |
| MW13 | W2.0 |
| MW15 | W2.3 |
| MW19 | W2.9 |
| MW20 | W3.1 |
| MW22 | W3.5 |
| MW25 | W3.9, except W3.5 in piles only |
| MW26 | W4.0 |
| MW30 | W4.7 |
| MW32 | W5.0 |
| MW35 | W5.4 |
| MW40 | W6.2 |
| MW45 | W6.5 |
| MW50 | W7.8 |
| MW55 | W8.5, except W8.0 in piles only |
| MW60 | W9.3 |
| MW70 | W10.9, except W11.0 in piles only |
| MW80 | W12.4 |
| MW90 | W14.0 |
| MW100 | W15.5 |

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

| METRIC BAR DESIGNATION NUMBER ¹ SHOWN ON THE PLANS | BAR DESIGNATION NUMBER ² TO BE SUBSTITUTED |
|--|--|
| 10 | 3 |
| 13 | 4 |
| 16 | 5 |
| 19 | 6 |
| 22 | 7 |
| 25 | 8 |
| 29 | 9 |
| 32 | 10 |
| 36 | 11 |
| 43 | 14 |
| 57 | 18 |

¹Bar designation numbers approximate the number of millimeters of the nominal diameter of the bars.

²Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

SUBSTITUTION TABLE FOR SIZES OF:

(1) STEEL FASTENERS FOR GENERAL APPLICATIONS (ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55), and

(2) HIGH STRENGTH STEEL FASTENERS (ASTM Designation: A 325 or A 449)

| METRIC SIZE SHOWN ON THE PLANS mm | SIZE TO BE SUBSTITUTED inch |
|--------------------------------------|--------------------------------|
| 6 or 6.35 | 1/4 |
| 8 or 7.94 | 5/16 |
| 10 or 9.52 | 3/8 |
| 11 or 11.11 | 7/16 |
| 13 or 12.70 | 1/2 |
| 14 or 14.29 | 9/16 |
| 16 or 15.88 | 5/8 |
| 19 or 19.05 | 3/4 |
| 22 or 22.22 | 7/8 |
| 24, 25, or 25.40 | 1 |
| 29 or 28.58 | 1-1/8 |
| 32 or 31.75 | 1-1/4 |
| 35 or 34.93 | 1-3/8 |
| 38 or 38.10 | 1-1/2 |
| 44 or 44.45 | 1-3/4 |
| 51 or 50.80 | 2 |
| 57 or 57.15 | 2-1/4 |
| 64 or 63.50 | 2-1/2 |
| 70 or 69.85 | 2-3/4 |
| 76 or 76.20 | 3 |
| 83 or 82.55 | 3-1/4 |
| 89 or 88.90 | 3-1/2 |
| 95 or 95.25 | 3-3/4 |
| 102 or 101.60 | 4 |

SUBSTITUTION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

| UNCOATED HOT AND COLD ROLLED SHEETS | | HOT-DIPPED ZINC COATED SHEETS (GALVANIZED) | |
|--|-----------------------------------|---|-----------------------------------|
| METRIC THICKNESS SHOWN ON THE PLANS mm | GAGE TO BE SUBSTITUTED inch | METRIC THICKNESS SHOWN ON THE PLANS mm | GAGE TO BE SUBSTITUTED inch |
| 7.94 | 0.3125 | 4.270 | 0.1681 |
| 6.07 | 0.2391 | 3.891 | 0.1532 |
| 5.69 | 0.2242 | 3.510 | 0.1382 |
| 5.31 | 0.2092 | 3.132 | 0.1233 |
| 4.94 | 0.1943 | 2.753 | 0.1084 |
| 4.55 | 0.1793 | 2.372 | 0.0934 |
| 4.18 | 0.1644 | 1.994 | 0.0785 |
| 3.80 | 0.1495 | 1.803 | 0.0710 |
| 3.42 | 0.1345 | 1.613 | 0.0635 |
| 3.04 | 0.1196 | 1.461 | 0.0575 |
| 2.66 | 0.1046 | 1.311 | 0.0516 |
| 2.28 | 0.0897 | 1.158 | 0.0456 |
| 1.90 | 0.0747 | 1.006 or 1.016 | 0.0396 |
| 1.71 | 0.0673 | 0.930 | 0.0366 |
| 1.52 | 0.0598 | 0.853 | 0.0336 |
| 1.37 | 0.0538 | 0.777 | 0.0306 |
| 1.21 | 0.0478 | 0.701 | 0.0276 |
| 1.06 | 0.0418 | 0.627 | 0.0247 |
| 0.91 | 0.0359 | 0.551 | 0.0217 |
| 0.84 | 0.0329 | 0.513 | 0.0202 |
| 0.76 | 0.0299 | 0.475 | 0.0187 |
| 0.68 | 0.0269 | ----- | ----- |
| 0.61 | 0.0239 | ----- | ----- |
| 0.53 | 0.0209 | ----- | ----- |
| 0.45 | 0.0179 | ----- | ----- |
| 0.42 | 0.0164 | ----- | ----- |
| 0.38 | 0.0149 | ----- | ----- |

SUBSTITUTION TABLE FOR WIRE

| METRIC THICKNESS SHOWN ON THE PLANS mm | WIRE THICKNESS TO BE SUBSTITUTED inch | GAGE NO. |
|---|--|-----------------|
| 6.20 | 0.244 | 3 |
| 5.72 | 0.225 | 4 |
| 5.26 | 0.207 | 5 |
| 4.88 | 0.192 | 6 |
| 4.50 | 0.177 | 7 |
| 4.11 | 0.162 | 8 |
| 3.76 | 0.148 | 9 |
| 3.43 | 0.135 | 10 |
| 3.05 | 0.120 | 11 |
| 2.69 | 0.106 | 12 |
| 2.34 | 0.092 | 13 |
| 2.03 | 0.080 | 14 |
| 1.83 | 0.072 | 15 |
| 1.57 | 0.062 | 16 |
| 1.37 | 0.054 | 17 |
| 1.22 | 0.048 | 18 |
| 1.04 | 0.041 | 19 |
| 0.89 | 0.035 | 20 |

SUBSTITUTION TABLE FOR PIPE PILES

| METRIC SIZE SHOWN ON THE PLANS mm x mm | SIZE TO BE SUBSTITUTED inch x inch |
|---|---|
| PP 360 x 4.55 | NPS 14 x 0.179 |
| PP 360 x 6.35 | NPS 14 x 0.250 |
| PP 360 x 9.53 | NPS 14 x 0.375 |
| PP 360 x 11.12 | NPS 14 x 0.438 |
| PP 406 x 12.70 | NPS 16 x 0.500 |
| PP 460 x T | NPS 18 x T" |
| PP 508 x T | NPS 20 x T" |
| PP 559 x T | NPS 22 x T" |
| PP 610 x T | NPS 24 x T" |
| PP 660 x T | NPS 26 x T" |
| PP 711 x T | NPS 28 x T" |
| PP 762 x T | NPS 30 x T" |
| PP 813 x T | NPS 32 x T" |
| PP 864 x T | NPS 34 x T" |
| PP 914 x T | NPS 36 x T" |
| PP 965 x T | NPS 38 x T" |
| PP 1016 x T | NPS 40 x T" |
| PP 1067 x T | NPS 42 x T" |
| PP 1118 x T | NPS 44 x T" |
| PP 1219 x T | NPS 48 x T" |
| PP 1524 x T | NPS 60 x T" |

The thickness in millimeters (T) represents an exact conversion of the thickness in inches (T").

SUBSTITUTION TABLE FOR STRUCTURAL TIMBER AND LUMBER

| METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm | METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm | NOMINAL SIZE TO BE SUBSTITUTED inch x inch |
|---|---|---|
| 19x89 | 20x90 | 1x4 |
| 38x89 | 40x90 | 2x4 |
| 64x89 | 65x90 | 3x4 |
| 89x89 | 90x90 | 4x4 |
| 140x140 | 143x143 | 6x6 |
| 140x184 | 143x190 | 6x8 |
| 184x184 | 190x190 | 8x8 |
| 235x235 | 241x241 | 10x10 |
| 286x286 | 292x292 | 12x12 |

SUBSTITUTION TABLE FOR NAILS AND SPIKES

| METRIC COMMON NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm | METRIC BOX NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm | METRIC SPIKE, SHOWN ON THE PLANS Length, mm Diameter, mm | SIZE TO BE SUBSTITUTED Penny-weight |
|--|---|---|--|
| 50.80 2.87 | 50.80 2.51 | ———— | 6d |
| 63.50 3.33 | 63.50 2.87 | ———— | 8d |
| 76.20 3.76 | 76.20 3.25 | 76.20 4.88 | 10d |
| 82.55 3.76 | 82.55 3.25 | 82.55 4.88 | 12d |
| 88.90 4.11 | 88.90 3.43 | 88.90 5.26 | 16d |
| 101.60 4.88 | 101.60 3.76 | 101.60 5.72 | 20d |
| 114.30 5.26 | 114.30 3.76 | 114.30 6.20 | 30d |
| 127.00 5.72 | 127.00 4.11 | 127.00 6.68 | 40d |
| ———— | ———— | 139.70 7.19 | 50d |
| ———— | ———— | 152.40 7.19 | 60d |

**SUBSTITUTION TABLE FOR IRRIGATION
COMPONENTS**

| METRIC WATER METERS, TRUCK LOADING STANDPIPES, VALVES, BACKFLOW PREVENTERS, FLOW SENSORS, WYE STRAINERS, FILTER ASSEMBLY UNITS, PIPE SUPPLY LINES, AND PIPE IRRIGATION SUPPLY LINES SHOWN ON THE PLANS DIAMETER NOMINAL (DN) mm | NOMINAL SIZE TO BE SUBSTITUTED inch |
|--|--|
| 15 | 1/2 |
| 20 | 3/4 |
| 25 | 1 |
| 32 | 1-1/4 |
| 40 | 1-1/2 |
| 50 | 2 |
| 65 | 2-1/2 |
| 75 | 3 |
| 100 | 4 |
| 150 | 6 |
| 200 | 8 |
| 250 | 10 |
| 300 | 12 |
| 350 | 14 |
| 400 | 16 |

Unless otherwise specified, substitutions of United States Standard Measures standard structural shapes corresponding to the metric designations shown on the plans and in conformance with the requirements in ASTM Designation: A 6/A 6M, Annex 2, will be allowed.

8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains the following list of Prequalified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

For those categories of materials included in the list of Prequalified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included in the list of Prequalified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Standard Specifications.

Materials and products may be added to the list of Prequalified and Tested Signing and Delineation Materials if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective

- A. Apex, Model 921 (100 mm x 100 mm)
- B. Ray-O-Lite, Models SS (100 mm x 100 mm), RS (100 mm x 100 mm) and AA (100 mm x 100 mm)
- C. Stimsonite, Models 88 (100 mm x 100 mm), 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- D. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

- A. Apex, Model 921AR (100 mm x 100 mm)
- B. Ray-O-Lite "AA" ARS (100 mm x 100 mm)
- C. Stimsonite, Models 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- D. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(Used for recessed applications)

- A. Stimsonite, Model 948 (58 mm x 119 mm)
- B. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
- C. Stimsonite, Model 944SB (51 mm x 100 mm)*
- D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*

*For use only in 114 mm wide (older) recessed slots

Non-Reflective For Use With Epoxy Adhesive, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Highway Ceramics, Inc. (Ceramic)

Non-Reflective For Use With Bitumen Adhesive, 100 mm Round

- A. Alpine Products, "D-Dot" and "ANR" (ABS)
- B. Apex Universal (Ceramic)
- C. Apex Universal, Model 929 (ABS)
- D. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
- E. Highway Ceramics, Inc. (Ceramic)
- F. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- G. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- H. Novabrite Models Adot-w (White) Adot-y (Yellow), (ABS)
- I. Road Creations, Model RCB4NR (Acrylic)
- J. Zumar Industries, "Titan TM40A" (ABS)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)

- A. Apex Universal, Model 924 (100 mm x 100 mm)
- B. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
- C. Road Creations, Model R41C (100 mm x 100 mm)
- D. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

Temporary Markers For Short Term Day/Night Use (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Davidson Plastics, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Brite-Line "DeltaLine XRP"
- D. Swarco Industries, "Director 35" (For transverse application only)

- E. Swarco Industries, "Director 60"
- F. 3M, "Stamark" Series 380 and 5730
- G. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)

- A. Advanced Traffic Marking, Series 200
- B. Brite-Line, Series 100
- C. P.B. Laminations, Aztec, Grade 102
- D. Swarco Industries, "Director-2"
- E. 3M, "Stamark," Series 620
- F. 3M Series A145 Removable Black Line Mask
(Black Tape: For use only on Asphalt Concrete Surfaces)
- G. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: For use only on Asphalt Concrete Surfaces)
- H. Brite-Line "BTR" Black Removable Tape
(Black Tape: For use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

- A. Flint Trading, "Premark" and "Premark 20/20 Flex"
- B. Pavemark, "Hotape"

Removable Traffic Paint

- A. Belpro, Series 250/252 and No. 93 Remover

Ceramic Surfacing Laminate, 150 mm x 150 mm

- A. Safeline Industries/Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

- A. Carsonite, Curve-Flex CFRM-400
- B. Carsonite, Roadmarker CRM-375
- C. Davidson Plastics, "Flexi-Guide Models 400 and 566"
- D. FlexStake, Model 654 TM
- E. GreenLine Models HWD1-66 and CGD1-66
- F. J. Miller Industries, Model JMI-375 (with soil anchor)

Special Use Flexible Type, 1700 mm

- A. Carsonite, "Survivor" (with 450 mm U-Channel base)
- B. FlexStake, Model 604
- C. GreenLine Models HWD and CGD (with 450 mm U-Channel base)
- D. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- E. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Flexible Type, 1200 mm

- A. Bent Manufacturing Company, Masterflex Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754 TM

CHANNELIZERS

Surface Mount Type, 900 mm

- A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- C. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- D. Davidson Plastics, Flex-Guide Models FG300LD and FG300UR
- E. FlexStake, Surface Mount, Models 703 and 753 TM
- F. GreenLine, Model SMD-36

- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
- I. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
- J. Repo, Models 300 and 400
- K. Safe-Hit, Guide Post, Model SH236SMA

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Roadmaker Company "Stacker"
- D. Traffix Devices "Grabber"

OBJECT MARKERS

Type "K", 450 mm

- A. Carsonite, Model SMD-615
- B. FlexStake, Model 701 KM
- C. Repo, Models 300 and 400
- D. Safe-Hit, Model SH718SMA
- E. The Line Connection, Model DP21-4K

Type "K-4" / "Q" Object Markers, 600 mm

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Carsonite, Super Duck II
- C. FlexStake, Model 701KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
- F. The Line Connection, Model DP21-4Q

TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS

Impactable Type

- A. ARTUK, "FB"
- B. Davidson Plastics, Model PCBM-12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100

Non-Impactable Type

- A. ARTUK, JD Series
- B. Stimsonite, Model 967 (with 83 mm Acrylic cube corner reflector)
- C. Stimsonite, Model 967LS
- D. Vega Molded Products, Models GBM and JD

THREE BEAM BARRIER MARKERS

(For use to the left of traffic)

- A. Duraflex Corp., "Railrider"
- B. Davidson Plastics, "Mini" (75 mm x 254 mm)

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 1200 mm)

- A. Davidson Plastics, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM
- C. Sun-Lab Technology, "Safety Guide Light, Model TM," 130 mm x 130 mm x 80 mm

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied vertically. Place top of 75 mm x 300 mm reflective element at 1200 mm above roadway)

- A. Davidson Plastics, PCBM S-36
- B. Sun-Lab Technology, "Safety Guide Light, Model SM12," 130 mm x 130 mm x 80 mm

GUARD RAILING DELINEATOR

(Top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

- A. Carsonite, Model 427
- B. Davidson Plastics FG 427 and FG 527
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. J. Miller Model JMI-375G
- F. Safe-Hit, Model SH227GRD

Steel Post Type

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

- A. 3M, High Intensity
- B. Reflexite, PC-1000 Metalized Polycarbonate
- C. Reflexite, AC-1000 Acrylic
- D. Reflexite, AP-1000 Metalized Polyester
- E. Reflexite, AR-1000 Abrasion Resistant Coating
- F. Avery Dennison T-6500 Series (Formerly Stimsonite, Series 6200) (For rigid substrate devices only)

Traffic Cones, 330 mm Sleeves

- A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

Traffic Cones, 100 mm and 150 mm Sleeves

- A. 3M Series 3840
- B. Reflexite Vinyl, "TR" (Semi-transparent) or "Conformalite"

Barrels and Drums

- A. Reflexite, "Super High Intensity" or "High Impact Drum Sheeting"
- B. 3M Series 3810

Barricades: Type I, Engineer Grade

- A. American Decal, Adcolite
- B. Avery Dennison, T-1500 and T-1600
- C. 3M, Scotchlite, Series CW

Barricades: Type II, Super Engineer Grade

- A. Avery Dennison, T-2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

Signs: Type II, Super Engineer Grade

- A. Avery Dennison, T-2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

Signs: Type III, High-Intensity Grade

- A. 3M Series 3800
- B. Nippon Carbide, Nikkalite Brand Ultralite Grade II

Signs: Type IV, High-Intensity Prismatic Grade

- A. Avery Dennison T-6500 (Formerly Stimsonite Series 6200)

Signs: Type VII, High-Intensity Prismatic Grade

- A. 3M Series 3900

Signs: Type VI, Roll-Up Signs

- A. Reflexite, Vinyl (Orange)
- B. Reflexite "SuperBright" (Fluorescent orange)
- C. Reflexite "Marathon" (Fluorescent orange)
- D. 3M Series RS34 (Orange) and RS20 (Fluorescent orange)

SPECIALTY SIGN (All Plastic)

- A. All Sign Products, STOP Sign, 750 mm

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

Aluminum

Fiberglass Reinforced Plastic (FRP)

- A. Sequentia, "Polyplate"
- B. Fiber-Brite

8-1.03 STATE-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Materials," of the Standard Specifications and these special provisions.

The following materials will be furnished to the Contractor:

- A. Sign panels for roadside signs.
- B. Self-adhesive reflective numbers for numbering electrical equipment.

The Contractor shall notify the Engineer not less than 48 hours before State-furnished material is to be picked up by the Contractor. A full description of the material and the time the material will be picked up shall be provided.

Sign panels for roadside signs, will be available at the District Maintenance warehouse, 7181 Opportunity Road, San Diego, California.

The Contractor, shall submit a written request to the Engineer for the delivery of State-furnished sign panels for roadside signs at least 120 days in advance of their intended installation.

8-1.04 SLAG AGGREGATE

Air-cooled iron blast furnace slag shall not be used to produce aggregate for:

- A. Structure backfill material.
- B. Pervious backfill material.
- C. Permeable material.
- D. Reinforced or prestressed portland cement concrete component or structure.

Aggregate produced from slag resulting from a steel-making process shall not be used for a highway construction project except for the following items:

- A. Class 2 Aggregate Base.
- B. Asphalt Concrete.

Steel slag to be used to produce aggregate for Class 2 aggregate base shall be crushed so that 100 percent of the material will pass a 19-mm sieve and then shall be control aged for a period of at least 3 months under conditions that will maintain all portions of the stockpiled material at a moisture content in excess of 6 percent of the dry mass of the aggregate.

A supplier of steel slag aggregate shall provide separate stockpiles for controlled aging of the slag. An individual stockpile shall contain not less than 9075 tonnes nor more than 45 350 tonnes of slag. The material in each individual stockpile shall be assigned a unique lot number and each stockpile shall be identified with a permanent system of signs. The supplier shall maintain a permanent record of the dates on which stockpiles are completed and controlled aging begun, of the dates when controlled aging was completed, and of the dates tests were made and the results of these tests. Moisture tests shall be made at least once each week. No credit for aging will be given for the time period covered by tests which show a moisture content of 6 percent or less. The stockpiles and records shall be available to the Engineer during normal working hours for inspection, check testing and review.

The supplier shall notify the Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, California 95819, when each stockpile is completed and controlled aging begun. No more aggregate shall be added to the stockpile unless a new aging period is initiated. A further notification shall be sent when controlled aging is completed.

The supplier shall provide a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. Each stockpile or portion of a stockpile that is used in the work will be considered a lot. The Certificates of Compliance shall state that the steel slag aggregate has been aged in a stockpile for at least 3 months at a moisture content in excess of 6 percent of the dry mass of the aggregate.

Each delivery of aggregate containing steel slag for use as Class 2 aggregate base shall be accompanied by a delivery tag for each load which will identify the lot of material by stockpile number, where the slag was aged, and the date that the stockpile was completed and controlled aging begun.

Air-cooled iron blast furnace slag or natural aggregate may be blended in proper combinations with steel slag aggregate to produce the specified gradings, for those items for which steel slag aggregate is permitted, unless otherwise provided.

Aggregate containing slag shall meet the applicable quality requirements for the items in which the aggregate is used.

The combined slag aggregate shall conform to the specified grading for the item in which it is used. The grading will be determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine portion of the aggregate or between blends of different aggregates.

No aggregate produced from slag shall be placed within 0.3-m, measured in any direction, of a non-cathodically protected pipe or structure unless the aggregate is incorporated in portland cement concrete pavement, in asphalt concrete, or in treated base.

When slag is used as aggregate in asphalt concrete, the K_c factor requirements, as determined by California Test 303, will not apply.

Slag aggregate used for embankment construction shall not be placed within 0.46-m of finished slope lines, measured normal to the plane of the slope.

If steel slag aggregates are used to make asphalt concrete, there shall be no other aggregates used in the mixture, except that up to 50 percent of the material passing the 4.75-mm sieve may consist of iron blast furnace slag aggregates or natural aggregates, or a combination thereof. If iron blast furnace aggregates or natural aggregates or a combination thereof are used in the mix, each type of aggregate shall be fed to the drier at a uniform rate. The rate of feed of each type of aggregate shall be maintained within 10 percent of the amount set. Adequate means shall be provided for controlling and checking the accuracy of the feeder.

In addition to the requirements of Section 39-3.01, "Storage," of the Standard Specifications, steel slag aggregate shall be stored separately from iron blast furnace slag aggregate and each type of slag aggregate shall also be stored separately from natural aggregate.

Asphalt concrete produced from more than one of the following shall not be placed in the same layer: steel slag aggregates, iron blast furnace slag aggregates, natural aggregates or any combination thereof. Once a type of aggregate or aggregates is selected, it shall not be changed without prior approval by the Engineer.

If steel slag aggregates are used to produce asphalt concrete, and if the specific gravity of a compacted stabilometer test specimen is in excess of 2.40, the quantity of asphalt concrete to be paid for will be reduced. The stabilometer test specimen will be fabricated in conformance with the procedures in California Test 304 and the specific gravity of the specimen will be determined in conformance with Method C of California Test 308. The pay quantity of asphalt concrete will be determined by multiplying the quantity of asphalt concrete placed in the work by 2.40 and dividing the result by the specific gravity of the compacted stabilometer test specimen. Such reduction in quantity will be determined and applied as often as is necessary to ensure accurate results as determined by the Engineer.

8-1.05 MISCELLANEOUS METAL

The table in the tenth paragraph of Section 75-1.02, "Miscellaneous Iron and Steel," of the Standard Specifications is amended to read:

| Material | Specification |
|---|--|
| Steel bars, plates and shapes | ASTM Designation: A 36/A 36M or A 575, A 576 (AISI or M Grades 1016 through 1030 except Grade 1017) |
| Steel fastener components for general applications: | |
| Bolts and studs | ASTM Designation: A 307 |
| Headed anchor bolts | ASTM Designation: A 307, Grade B, including S1 supplementary requirements |
| Nonheaded anchor bolts | ASTM Designation: A 307, Grade C, including S1 supplementary requirements and S1.6 of AASHTO Designation: M 314 supplementary requirements or AASHTO Designation: M 314, Grade 36 or 55, including S1 supplementary requirements |
| High-strength bolts and studs, threaded rods, and nonheaded anchor bolts | ASTM Designation: A 449, Type 1 |
| Nuts | ASTM Designation: A 563, including Appendix X1* |
| Washers | ASTM Designation: F 844 |
| Components of high-strength steel fastener assemblies for use in structural steel joints: | |
| Bolts | ASTM Designation: A 325, Type 1 |
| Tension control bolts | ASTM Designation: F 1852, Type 1 |
| Nuts | ASTM Designation: A 563, including Appendix X1* |
| Hardened washers | ASTM Designation: F 436, Type 1, Circular, including S1 supplementary requirements |
| Direct tension indicators | ASTM Designation: F 959, Type 325, zinc-coated |
| Stainless steel fasteners (Alloys 304 & 316) for general applications: | |
| Bolts, screws, studs, threaded rods, and nonheaded anchor bolts | ASTM Designation: F 593 or F 738M |
| Nuts | ASTM Designation: F 594 or F 836M |
| Washers | ASTM Designation: A 240/A 240M and ANSI B 18.22M |
| Carbon-steel castings | ASTM Designation: A 27/A 27M, Grade 65-35 [450-240], Class 1 |
| Malleable iron castings | ASTM Designation: A 47, Grade 32510 or A 47M, Grade 22010 |
| Gray iron castings | ASTM Designation: A 48, Class 30B |
| Ductile iron castings | ASTM Designation: A 536, Grade 65-45-12 |
| Cast iron pipe | Commercial quality |
| Steel pipe | Commercial quality, welded or extruded |
| Other parts for general applications | Commercial quality |

* Zinc-coated nuts that will be tightened beyond snug or wrench tight shall be furnished with a dyed dry lubricant conforming to Supplementary Requirement S2 in ASTM Designation: A 563.

The table in the eighteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

| Stud Diameter (millimeters) | Sustained Tension Test Load (kilonewtons) |
|--------------------------------|---|
| 29.01-33.00 | 137.9 |
| 23.01-29.00 | 79.6 |
| 21.01-23.00 | 64.1 |
| * 18.01-21.00 | 22.2 |
| 15.01-18.00 | 18.2 |
| 12.01-15.00 | 14.2 |
| 9.01-12.00 | 9.34 |
| 6.00-9.00 | 4.23 |

* Maximum stud diameter permitted for mechanical expansion anchors.

The table in the nineteenth paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

| Stud Diameter (millimeters) | Ultimate Tensile Load (kilonewtons) |
|--------------------------------|---|
| 30.01-33.00 | 112.1 |
| 27.01-30.00 | 88.1 |
| 23.01-27.00 | 71.2 |
| 20.01-23.00 | 51.6 |
| 16.01-20.00 | 32.0 |
| 14.01-16.00 | 29.4 |
| 12.00-14.00 | 18.7 |

The table in the twenty-second paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

| Installation Torque Values, (newton meters) | | | |
|---|--|--|--|
| Stud Diameter (millimeters) | Shell Type Mechanical Expansion Anchors | Integral Stud Type Mechanical Expansion Anchors | Resin Capsule Anchors and Cast-in-Place Inserts |
| 29.01-33.00 | — | — | 540 |
| 23.01-29.00 | — | — | 315 |
| 21.01-23.00 | — | — | 235 |
| 18.01-21.00 | 110 | 235 | 200 |
| 15.01-18.00 | 45 | 120 | 100 |
| 12.01-15.00 | 30 | 65 | 40 |
| 9.01-12.00 | 15 | 35 | 24 |
| 6.00-9.00 | 5 | 10 | — |

8-1.06 ENGINEERING FABRICS

Engineering fabrics shall conform to the provisions in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

Filter fabric for this project shall be ultraviolet (UV) ray protected.

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

References to Section 90-2.01, "Portland Cement," of the Standard Specifications shall mean Section 90-2.01, "Cement," of the Standard Specifications.

Mineral admixture shall be combined with cement in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications for the concrete materials specified in Section 56-2, "Roadside Signs," of the Standard Specifications.

The requirements of Section 90-4.08, "Required Use of Mineral Admixture," of the Standard Specifications shall not apply to Section 19-3.025C, "Soil Cement Bedding," of the Standard Specifications.

8-2.02 CEMENT AND WATER CONTENT

Except for concrete listed below, all concrete which is designated as Class 2 and all concrete for use in structures shall contain not less than 375 kg of cement per cubic meter and shall be air-entrained as provided in Section 90-4, "Admixtures," of the Standard Specifications. The air content at time of mixing and prior to placing shall be 3 percent \pm one percent.

- A. Paving concrete.
- B. Concrete designated by 28-day compressive strength.
- C. Concrete designated as Class 1 or by a cement content which exceeds 375 kg/m³.
- D. Seal course concrete.
- E. Concrete for deck slabs of bridges and structure approach slabs.
- F. Concrete for piling.

Except for concrete for deck slabs of bridges and structure approach slabs, the amount of free water used in concrete shall not exceed 204 kg/m³, plus 20 kg for each required 100 kg of cement in excess of 375 kg/m³.

The amount of free water used in concrete for deck slabs of bridges and structure approach slabs shall not exceed 201 kg/m³, plus 20 kg for each required 100 kg of cement in excess of 400 kg/m³.

SECTION 8-3. WELDING

8-3.01 WELDING

GENERAL

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform any type of welding for this project.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans, or in these special provisions, the year of adoption for these codes shall be as listed:

| AWS Code | Year of Adoption |
|--------------------|------------------|
| D1.1 | 2000 |
| D1.4 | 1992 |
| D1.5 | 1995 |
| D1.5 (metric only) | 1996 |

Requirements of the AWS welding codes shall apply unless specified otherwise in the Standard Specifications, on the plans, or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or ANSI/AASHTO/AWS.

Sections 6.1.2 through 6.1.4.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing prior to welding, during welding, and after welding as specified in this section and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The QC Inspector shall be the duly designated person who acts for and on behalf of the Contractor for inspection, testing, and quality related matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

Each QC Inspector shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as an AWS Certified Welding Inspector (CWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Section 6.14.6, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4, and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are replaced with the following:

Personnel performing nondestructive testing (NDT) shall be qualified in conformance with the requirements of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the requirements of the ASNT Recommended Practice No. SNT-TC-1A. Only individuals who are 1) qualified for NDT Level II, or 2) Level III technicians who have been directly certified by the ASNT and are authorized to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved welding procedure specification (WPS) are met.

Section 6.5.4 of AWS D 1.5 is replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of Sections 3 and 9.21. The size and contour of welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS welding codes, in the Standard Specifications, or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work but shall be at the Contractor's expense.

Required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means.

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present when any welding operation is being performed, or (2) having a QC Inspector within such close proximity of all welding operations that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

WELDING QUALITY CONTROL

Welding quality control shall conform to the requirements in the AWS welding codes, the Standard Specifications, and these special provisions.

Unless otherwise specified, welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," Section 56-1, "Overhead Sign Structures," Section 75-1.035, "Bridge Joint Restrainer Units," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

The welding of fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

The Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of welding, including materials and workmanship, performed by the Contractor and subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, and approving all correspondence, required submittals, and reports to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

Welding inspection personnel or NDT firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for the following conditions:

- A. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.
- B. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures. This condition shall apply only for work welded in conformance with the provisions in Section 56-1, "Overhead Sign Structures" or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

For welding performed at such certified facilities, the inspection personnel or NDT firms may be employed or compensated by the fabrication facility performing the welding.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a pre-welding meeting between the Engineer, Contractor, and any entity performing welding for this project, shall be held to discuss the requirements for the WQCP.

Except for work that is welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, prior to performing any welding, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each item of work for which welding is to be performed.

Prior to furnishing materials welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each fabrication facility supplying these materials or proof of previous Engineer approval of a WQCP for such a facility no more than one year prior to the delivery of materials for inspection.

As a minimum, each WQCP shall include the following:

- A. The name of the welding firm and any required NDT firms;

- B. A manual prepared by the NDT firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT firm, and the names, qualifications, and documentation of certifications for all personnel to be used;
- C. The name of the QCM and the names, qualifications, and documentation of certifications for all QC Inspectors and Assistant QC Inspectors to be used;
- D. An organizational chart showing all QC personnel and their assigned QC responsibilities;
- E. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
 - 1. all visual inspections;
 - 2. all NDT including radiographic geometry, penetrometer and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports; and
 - 3. calibration procedures and calibration frequency for all NDT equipment;
- F. A system for the identification and tracking of all welds, NDT, and any required repairs, and a procedure for the reinspection of repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld, 2) placing all identification and tracking information on each radiograph, 3) a method of reporting nonconforming welds to the Engineer, and 4) a method of documentation of repairs and reinspection of nonconforming welds;
- G. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size;
- H. The WPS, including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness;
- I. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness;
- J. One copy each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department; and
- K. Forms to be used for Certificates of Compliance, daily production logs, and daily reports.

The Engineer shall have 10 working days to review the WQCP submittal after a complete plan has been received. Except for work that is welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, no welding shall be performed until the WQCP is approved in writing by the Engineer. No materials welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, shall be incorporated into the work until the WQCP is approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the WQCP, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or addendum shall be submitted to, and approved in writing by the Engineer, for proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for revisions to the WQCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC, or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended WQCP or addendum. Work that is affected by any of the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the amended WQCP or addendum, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

After final approval of the WQCP, amended WQCP, or addendum, the Contractor shall submit 7 copies to the Engineer of these approved documents.

It is expressly understood that the Engineer's approval of the Contractor's WQCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any requirement of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials, and equipment may be rejected notwithstanding approval of the WQCP.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, except partial penetration longitudinal seam welds performed in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications. The log shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each QC Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding. For work welded in conformance with Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, the following items shall be included in a Welding Report that is to be submitted to the Engineer 48 hours prior to the Contractor furnishing a Certificate of Compliance for the material:

- A. Reports of all visual weld inspections and NDT;
- B. Radiographs and radiographic reports, and other required NDT reports;
- C. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests and corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable; and
- D. Daily production log.

Radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the WQCP. In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the WQCP.

Reports regarding NDT, including radiographs, shall be signed by both the NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Unless otherwise specified, the Engineer shall be allowed 7 working days to review the report and respond in writing after a complete Welding Report has been received. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover welds pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, the Engineer shall be notified immediately in writing when welding problems, deficiencies, base metal repairs, or any other type of repairs not submitted in the WQCP are discovered and also of the proposed repair procedures to correct them. The Engineer shall have 5 working days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the proposed repair procedures, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in conformance with the details shown on the plans and the provisions of the Standard Specifications and these special provisions.

PAYMENT

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

SECTION 9. DESCRIPTION OF BRIDGE WORK

The work to be done consists, in general, of the construction of the following structure as shown on the plans and as briefly described as follows:

SWEETWATER CHANNEL BIKE PATH BRIDGE (Bridge No. 57-1032Z)

A three-span, cast-in-place, prestressed, concrete box girder bike path bridge, approximately 123 meters in length and 4.27 meters in width.

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.00 CONSTRUCTION PROJECT INFORMATION SIGNS

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect 1 Type 2 Construction Project Information signs at the locations designated by the Engineer.

The signs and overlays shall be of a type and material consistent with the estimated time of completion of the project and shall conform to the details shown on the plans.

The sign letters, border and the Department's construction logos shall conform to the colors (non-reflective) and details shown on the plans, and shall be on a white background (non-reflective). The colors blue and orange shall conform to PR Color Number 3 and Number 6, respectively, as specified in the Federal Highway Administration's Color Tolerance Chart.

The sign message to be used for fund types shall consist of the following, in the order shown:

| |
|-----------------------------|
| FEDERAL HIGHWAY TRUST FUNDS |
| STATE HIGHWAY FUNDS |

The sign message to be used for type of work shall consist of the following:

| |
|---------------------|
| HIGHWAY IMPROVEMENT |
|---------------------|

The sign message to be used for the Year of Completion of Project Construction will be furnished by the Engineer. The Contractor shall furnish and install the "Year" sign overlay within 10 working days of notification of the year date to be used.

The letter sizes to be used shall be as shown on the plans. The information shown on the signs shall be limited to that shown on the plans.

The signs shall be kept clean and in good repair by the Contractor.

Upon completion of the work, the signs shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information signs shall be considered as included in the contract lump sum price paid for construction area signs and no additional compensation will be allowed therefor.

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

Prior to beginning construction, the Contractor shall:

- 1) Brief all persons associated with the construction and operations of the bike path regarding constraints associated with terms and condition of this contract.
- 2) Place temporary fence (Type ESA) at ESA areas, as shown on the plans.
- 3) Install temporary fiber rolls and other sediment control devices to prevent erosion and additional sedimentation of wetland areas.

The Contractor shall not engage in construction activities within 54 meters of any freshwater or salt water marsh habitats, except during "Water Pollution Control" between March 15 and September 15.

At the marsh, all nighttime work should be avoided. If nighttime work cannot be avoided, all lighting shall be shielded and directed towards the work, so that no additional light enters the marsh.

Pile driving shall occur only between September 17 and January 31.

Attention is directed to "Water Pollution Control" elsewhere in these special provisions.

Temporary railing (Type K), traffic plastic drums and temporary crash cushions shall be secured in place prior to commencing work for which the temporary railing, traffic plastic drums and crash cushions are required.

Prior to commencement of the traffic signal functional test at any location, all items of work related to signal control shall be completed and all roadside signs, pavement delineation, and pavement markings shall be in place at that location.

Attention is directed to "Maintaining Traffic" and "Temporary Pavement Delineation" of these special provisions and to the stage construction sheets of the plans.

Attention is directed to "Progress Schedule (Critical Path Method)" of these special provisions regarding the submittal of a general time-scaled logic diagram within 10 days after approval of the contract.

Not less than 60 days prior to planting the plants, the Contractor shall furnish the Engineer a statement from the vendor that the order for the plants required for this contract, including inspection plants, has been received and accepted by the vendor. The statement from the vendor shall include the names, sizes, and quantities of plants ordered and the anticipated date of delivery.

The Contractor shall place orders for replacement plants with the vendor at the appropriate time so that the roots of the replacement plants are not in a root-bound condition.

Not less than 60 days prior to applying seeds, the Contractor shall furnish the Engineer a statement from the vendor that the order for the seed required for this contract has been received and accepted by the vendor. The statement from the vendor shall include the names and quantity of seed ordered and the anticipated date of delivery.

Attention is directed to "Irrigation Systems Functional Test" of these special provisions, regarding restrictions for planting operations.

Attention is directed to "Erosion Control (Type D)" of these special provisions regarding the time restraints specified for applying erosion control materials.

Attention is directed to "Locate Existing Crossovers and Conduits" of these special provisions regarding locating existing irrigation water line crossovers and conduits shown on the plans to be incorporated in the new work. Existing irrigation water line crossovers and conduits shall be located prior to performing work on the irrigation system.

Unless otherwise shown on the plans or specified in these special provisions, conduits to be jacked or drilled or installed by the open trench method for water line crossovers and sprinkler control crossovers shall be installed prior to the installation of other pipe supply lines.

Clearing, grubbing, and earthwork operations shall not be performed in areas where existing irrigation facilities are to remain in place until existing irrigation facilities have been checked for proper operation in conformance with the provisions in "Highway Planting and Irrigation Systems" of these special provisions.

Existing conduits to be extended shall be located in conformance with the provisions in "Extend Irrigation Crossovers" of these special provisions prior to the start of other work in these areas.

Attention is directed to Section 20-5.027B, "Wiring Plans and Diagrams," of the Standard Specifications regarding submittal of working drawings.

10-1.02 WATER POLLUTION CONTROL

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

Water pollution control work shall conform to the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual" and the "Construction Site Best Management Practices (BMPs) Manual," and addenda thereto issued up to, and including, the date of advertisement of the project, hereafter referred to respectively as the "Preparation Manual" and the "Construction Site BMP Manual" and collectively as the "Manuals." Copies of the Manuals may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520. Copies of the Manuals may also be obtained from the Department's Internet Web Site at: <http://www.dot.ca.gov/hq/construc/stormwater.html>.

Copies of the Manuals are also available for review at Caltrans District Office, District Construction Liaison Office, 2829 Juan Street, San Diego, CA 92110, Telephone (619) 688-6635.

The Contractor shall know and fully comply with the applicable provisions of the Manuals and Federal, State, and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility whatsoever to the Contractor or property owner with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for liabilities imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Manuals and Federal, State, and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties, and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to the remedies authorized by law, an amount of the money due the Contractor under the contract, as determined by the Department, may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
- B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
- C. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the provisions in this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities as provided in Section 7, "Legal Relations and Responsibilities," of the Standard Specifications.

WATER POLLUTION CONTROL PROGRAM PREPARATION, APPROVAL AND UPDATES

As part of the water pollution control work, a Water Pollution Control Program, hereafter referred to as the "WPCP," is required for this contract. The WPCP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, and these special provisions.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the WPCP has been approved by the Engineer.

Within 15 days after the approval of the contract, the Contractor shall submit 5 copies of the WPCP to the Engineer. The Engineer will have 7 days to review the WPCP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the WPCP within 3 days of receipt of the Engineer's comments. The Engineer will have 3 days to review the revisions. Upon the Engineer's approval of the WPCP, 3 additional copies of the WPCP incorporating the required changes shall be submitted to the Engineer. Minor changes or clarifications to the initial submittal may be made and attached as amendments to the WPCP. In order to allow construction activities to proceed, the Engineer may conditionally approve the WPCP while minor revisions or amendments are being completed.

The WPCP shall identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and shall identify water pollution control measures, hereafter referred to as control measures, to be constructed, implemented, and maintained in order to reduce to the extent feasible pollutants in storm water discharges from the construction site during construction under this contract.

The WPCP shall incorporate control measures in the following categories:

- A. Soil stabilization;
- B. Sediment control;
- C. Tracking control;
- D. Wind erosion control;
- E. Non-storm water control; and
- F. Waste management and material pollution control.

Specific objectives and minimum requirements for each category of control measures are contained in the Manuals.

The Contractor shall consider the objectives and minimum requirements presented in the Manuals for each of the above categories. When minimum requirements are listed for any category, the Contractor shall incorporate into the WPCP and implement on the project, one or more of the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Manuals and

shall incorporate into the WPCP and implement on the project the control measures necessary to meet the objectives of the WPCP. The Contractor shall document the selection process in conformance with the procedure specified in the Manuals.

The following contract items of work shall be incorporated into the WPCP as critical temporary control measures: Temporary fiber roll, temporary erosion control, temporary gravel bag, temporary concrete washout and temporary construction entrance. The Contractor shall consider other control measures to supplement these critical temporary control measures when necessary to meet the pollution control objectives of the WPCP.

The following contract items of work, as shown on the project plans, shall be incorporated in the WPCP as permanent post-construction control measures: Erosion control (Type D). These control measures shall be utilized as construction period control measures. Attention is directed to "Order of Work" of these special provisions. The Contractor shall consider other control measures to supplement these permanent, post-construction control measures when necessary to meet the pollution control objectives of the WPCP. The Contractor shall maintain and protect the permanent control measures throughout the duration of the project and shall restore these controls to the lines and grades shown on the plans prior to acceptance of the project.

The WPCP shall include, but not be limited to, the following items as described in the Preparation Manual:

- A. Project description and Contractor's certification;
- B. Project information;
- C. Pollution sources, control measures, and water pollution control drawings; and
- D. Amendments, if any.

The Contractor shall amend the WPCP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems or when deemed necessary by the Engineer. The WPCP shall be amended if the WPCP has not achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved WPCP, which are required on the project to control water pollution effectively. Amendments to the WPCP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved WPCP. Amendments shall be dated and attached to the on-site WPCP document.

The Contractor shall keep a copy of the WPCP, together with updates, revisions and amendments at the project site.

WPCP IMPLEMENTATION

Upon approval of the WPCP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, and maintaining the control measures included in the WPCP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for WPCP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of control measures are specified in the Manuals and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the rainy season, defined as between October 1 and May 1.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas on the project site shall be completed, except as provided for below, not later than 20 days prior to the beginning of the rainy season or upon start of applicable construction activities for projects which begin either during or within 20 days of the rainy season.

Throughout the rainy season, the active, soil-disturbed area of the project site shall be not more than 1.95 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect soil-disturbed areas on the project site before the onset of precipitation. A quantity of soil stabilization and sediment control materials shall be maintained on site equal to 100 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. A current inventory of control measure materials and the detailed mobilization plan shall be included as part of the WPCP.

Throughout the rainy season, soil-disturbed areas on the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 20 or more days and the areas are fully protected. Areas that will become nonactive either during the rainy season or within 20 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 10 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the rainy season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and functioning control measures shall be deployed prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the WPCP for tracking control, wind erosion control, non-storm water control, and waste management and material pollution control.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the provisions in this section "Water Pollution Control" as determined by the Engineer.

MAINTENANCE

To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the WPCP. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinitiate any measures that have been discontinued.

The construction site inspection checklist provided in the Preparation Manual shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. One copy of each site inspection record shall be submitted to the Engineer.

During the rainy season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

- A. Prior to a forecast storm;
- B. After all precipitation which causes runoff capable of carrying sediment from the construction site;
- C. At 24-hour intervals during extended precipitation events; and
- D. Routinely, at a minimum of once every 2 weeks.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the State.

WATER POLLUTION CONTROL TRAINING

The Contractor's management and supervisory personnel along with workers involved with the placement and maintenance of storm water pollution prevention best management practices shall be trained on general storm water pollution control requirements consistent with the "Construction Site Best Management Practices (BMP)". The training is to be provided by the Contractor. The amount of training provided should commensurate with the job performed by the employee.

PAYMENT

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Those control measures for which there is a contract item of work will be measured and paid for as that contract item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the provisions in this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the provisions in this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the provisions in this section will be released for payment on the next monthly estimate for partial payment following the date that a WPCP has been implemented and maintained and water pollution is adequately controlled, as determined by the Engineer.

10-1.03 TEMPORARY EROSION CONTROL

Temporary erosion control shall conform to the provisions for erosion control in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Attention is directed to "Water Pollution Control" of these special provisions.

Temporary erosion control work shall consist of applying erosion control materials to embankment slopes, excavation slopes and other areas designated on the plans. Temporary erosion control work shall be completed in the designated areas during the period starting October 1 and ending May 1, or within 21 days after an area becomes inactive during this period as defined in "Water Pollution Control" of these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

Stabilizing Emulsion

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

The requirement of an effective life of at least one year for stabilizing emulsion shall not apply.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive.

APPLICATION

Temporary erosion control materials shall be applied in one application:

A. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

| Material | Kilograms Per Hectare (Slope Measurement) |
|-------------------------------|--|
| Fiber | 2500 |
| Stabilizing Emulsion (solids) | 300 |

B. The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

MEASUREMENT AND PAYMENT

Temporary erosion control work will be measured by the square meter or hectare, whichever is designated in the contract item. The quantity of temporary erosion control to be paid for by the square meter or hectare will be calculated on the basis of actual or computed slope measurements.

Items of temporary erosion control work will be either paid for at the contract price per square meter or hectare for temporary erosion control, whichever is involved in the temporary erosion control work and designated in the contract items.

Temporary erosion control placed at locations other than as shown on the project plans or directed by the Engineer, in conformance with the Contractor's Water Pollution Control Program, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary erosion control required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary erosion control.

10-1.04 TEMPORARY FIBER ROLL

Temporary fiber rolls shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Temporary fiber rolls shall be furnished, installed, maintained, and removed at the locations shown on the plans.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials for temporary fiber rolls shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications.

Temporary fiber roll shall consist of prefabricated wheat or rice straw in rolls with a minimum diameter of 200 mm. The rolls shall be bound with an ultraviolet (UV) degradable plastic netting and shall weigh not less than 1.9 kg per linear meter.

Stakes shall be fir or pine and shall have a cross-sectional area of at least 360 mm² and a minimum length of 600 mm.

INSTALLATION

Temporary fiber roll shall be installed as shown on the plans and in conformance with Detail SC-5 in Section 4 of the Site Best Management Practices (BMP) Manual of the Caltrans Storm Water Quality Handbooks and the manufacturer's recommendations.

Temporary fiber rolls shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. When no longer required for the intended purpose, as determined by the Engineer, temporary fiber rolls shall be removed from the site of the work.

MEASUREMENT AND PAYMENT

The quantity of temporary fiber roll will be measured by the meter as determined from one end to the other end along the surface of the roll.

The contract price paid per meter for temporary fiber roll shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary fiber rolls, complete in place, including maintenance and removal of materials, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary fiber roll placed at locations other than as shown on the plans or where directed by the Engineer, in conformance with the Contractor's Water Pollution Control Program will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary fiber roll required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary fiber roll.

10-1.05 TEMPORARY FENCE (TYPE ESA)

Temporary fence (Type ESA) shall be furnished and constructed, maintained, and later removed as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Temporary fence (Type ESA) shall be constructed prior to any clearing and grubbing work and a sufficient distance from protected plants to enclose all of the foliage canopy and not encroach upon visible roots of the plants. Temporary fence (Type ESA) shall be located unobstructed from view by heavy equipment operators and other construction workers.

Used materials may be installed providing the used materials are good, sound, and are suitable for the purpose intended, as determined by the Engineer.

Materials may be commercial quality providing the dimensions and sizes of the materials are equal to, or greater than, the dimensions and sizes shown on the plans or specified herein. Fabric used for Temporary fence (Type ESA) shall also conform to the following:

| | |
|-----------------------|-------------------------------|
| Material: | Polypropylene or Polyethylene |
| Color: | Orange |
| Mesh opening: | 50 mm x 50 mm |
| UV Resistance: | Fully Stabilized |
| Fabric Height (min.): | 1.0 m |

Posts shall be either metal or wood at the Contractor's option, shall be suitable for the purpose intended and shall be driven into the soil a minimum of 400 mm. Post spacing shall be adequate to completely support the fence fabric in an upright position. Metal post shall be a minimum size of 21.5 mm diameter x 1600 mm in length. Wood post shall be minimum of 25 mm x 50 mm x 1600 mm.

Galvanizing and painting of steel items will not be required.

Treating wood with wood preservatives will not be required.

Concrete footings for posts will not be required.

Temporary fence (Type ESA) that is damaged from any cause during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

When no longer required for the work as determined by the Engineer, temporary fence (Type ESA) shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work, except as otherwise provided in this section.

Holes caused by the removal of temporary fence (Type ESA) shall be backfilled in accordance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

Temporary fence (Type ESA) will be measured and paid for in the manner specified for permanent fences as provided in Section 80, "Fences," of the Standard Specification.

Full compensation for maintaining, removing, and disposing of temporary fence (Type ESA) shall be considered as included in the price paid per meter for temporary fence (Type ESA) and no additional compensation will be allowed therefor.

10-1.06 TEMPORARY SOUND WALL

Temporary sound wall shall be furnished, constructed, maintained, and later removed as shown on the plans, as specified in these special provisions and as directed by the Engineer.

Except as otherwise specified in this section, temporary sound wall shall conform to the plan details.

Used materials may be installed provided the used materials are good, sound and are suitable for the purpose intended, as determined by the Engineer.

Materials may be commercial quality provided the dimensions and sizes of the materials are equal to, or greater than, the dimensions and sizes shown on the plans or specified herein.

Treating wood with a wood preservative will not be required.

Temporary sound wall that is damaged during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

When no longer required for the work, as determined by the Engineer, temporary sound wall shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work, except as otherwise provided in this section.

Holes caused by the removal of temporary sound wall shall be backfilled in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

The temporary sound wall will be measured and paid for in the same manner specified for permanent fence as provided in Section 80, "Fences," of the Standard Specifications.

Full compensation for maintaining, removing, and disposing of temporary sound wall shall be considered as included in the contract price paid per meter for temporary sound wall and no additional compensation will be allowed therefor.

10-1.07 TEMPORARY GRAVEL BAG

Temporary gravel bag shall conform to the details shown on the plans and these special provisions.

Temporary gravel bag shall be furnished, installed, maintained and removed at the locations shown on the plans.

Preparation shall conform to the provisions in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications.

Gravel bag fabric shall be woven polypropylene, polyethylene or Polyamide with a minimum unit weight of 135 g/m². The fabric shall have a mullen burst strength of at least 2067 kPa, conforming to the requirements in ASTM Designation: D 3786 and an ultraviolet (UV) stability exceeding 70 percent.

Gravel bags, when filled, shall have nominal dimensions (length x width x height) of 400 mm x 300 mm x 150 mm, and a filled mass of 13 kg to 22 kg.

Gravel bag fill material shall be non-cohesive gravel, free from deleterious material.

INSTALLATION

Temporary gravel bags placed in multiple layers shall be installed as shown on the plans and in conformance with Detail Sheet 1 in Appendix C, CD38(2) in the Construction Contractors Guide and Specifications of the Caltrans Storm Water Quality Handbooks.

INSTALLATION

Temporary gravel bag shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the deposit reaches one-third of the temporary gravel bag barrier height. Removed sediment shall be deposited within the project in such a way that the sediment is not subject to erosion by wind or water, or as directed by the Engineer.

When no longer required for the intended purpose, as determined by the Engineer, temporary gravel bag shall be removed from the site of the work.

Holes, depressions or any other ground disturbance caused by the removal of the temporary gravel bag shall be backfilled and repaired in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary gravel bags will be measured by the unit as determined from actual count in place.

The contract unit price paid for temporary gravel bag shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary gravel bag complete in place, including maintenance and removal of materials, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary gravel bag placed at locations other than as shown on the project plans or directed by the Engineer, in accordance with the Contractor's Water Pollution Control Program, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary gravel bags required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary gravel bags.

10-1.08 TEMPORARY CONCRETE WASHOUT

Temporary concrete washout shall consist of a commercially available 208 liter drum. Drums may be placed within the project limits only during the hours of construction. Temporary concrete washout facilities shall be maintained daily.

Attention is directed to "Water Pollution Control" elsewhere in these special provisions.

Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete. Concrete waste materials shall be removed and disposed of in conformance with the provisions in Section 15-3.02, "Removal Methods," of the Standard Specifications.

Materials for temporary concrete washout shall become the property of the Contractor and shall be removed from the site of the work each day and disposed of outside of the highway right of way in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Temporary concrete washout will be measured by the unit as determined from actual count in place.

The contract unit price paid for temporary concrete washout shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in temporary concrete washout, including maintaining, removing and disposing of concrete waste, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.09 TEMPORARY CONSTRUCTION ENTRANCE

Temporary construction entrance shall be constructed, maintained, and later removed as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The exact location of the temporary construction entrance will be determined by the Engineer.

Attention is directed to "Water Pollution Control" elsewhere in these special provisions.

Filter fabric shall conform to the requirements in Section 68-1, "Underdrains" of the Standard Specifications.

The aggregate shall conform to 37.5 mm x 19 mm grading and the requirements in Section 90-3.02, "Coarse Aggregate Grading" of the Standard Specifications.

Aggregate shall be clean and free from vegetable matter and other deleterious substances.

Steel plates shall conform to the requirements of the first paragraph in Section 75-1.02, "Miscellaneous Iron and Steel," of the Standard Specifications.

When no longer required for the work, as determined by the Engineer, temporary construction entrance shall be removed by the Contractor and disposed of outside of the highway right of way in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Trenches, depressions and pits caused by the removal of temporary construction entrance shall be backfilled in accordance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications..

Temporary construction entrance will be paid for by the unit from actual count.

The contract unit price paid for temporary construction entrance shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing temporary construction entrance, complete in place, including excavation, steel plates, aggregate and filter fabric, maintaining, removing, backfilling and disposing of temporary construction entrance as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.10 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

The Contractor may be relieved of the duty of maintenance and protection for those items not directly connected with plant establishment work, except highway planting and irrigation systems in conformance with the provisions in Section 7-1.15, "Relief From Maintenance and Responsibility," of the Standard Specifications.

10-1.11 PROGRESS SCHEDULE (CRITICAL PATH METHOD)

The Contractor shall submit to the Engineer practicable critical path method (CPM) progress schedules in conformance with these special provisions. Whenever the term "schedule" is used in this section it shall mean CPM progress schedule.

The provisions in Section 8-1.04, "Progress Schedule," of the Standard Specifications shall not apply.

DEFINITIONS

The following definitions shall apply to this section:

- A. **ACTIVITY.**—A task, event or other project element on a schedule that contributes to completing the project. Activities have a description, start date, finish date, duration and one or more logic ties.
- B. **BASELINE SCHEDULE.**—The initial schedule representing the Contractor's work plan on the first working day of the project.
- C. **CONTRACT COMPLETION DATE.**—The current extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer in conformance with the provisions in Section 8-1.06, "Time of Completion," of the Standard Specifications.
- D. **CRITICAL PATH.**—The longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path will extend the scheduled completion date.
- E. **CRITICAL PATH METHOD (CPM).**—A network based planning technique using activity durations and the relationships between activities to mathematically calculate a schedule for the entire project.
- F. **DATA DATE.**—The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."
- G. **FLOAT.**—The difference between the earliest and latest allowable start or finish times for an activity.
- H. **MILESTONE.**—An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.
- I. **NEAR CRITICAL PATH.**—A chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.
- J. **SCHEDULED COMPLETION DATE.**—The planned project finish date shown on the current accepted schedule.
- K. **TOTAL FLOAT.**—The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.
- L. **UPDATE SCHEDULE.**—A current schedule developed from the baseline or subsequent schedule through regular monthly review to incorporate as-built progress and any planned changes.

GENERAL REQUIREMENTS

The Contractor shall submit to the Engineer baseline, monthly update and final update schedules, each consistent in all respects with the time and order of work requirements of the contract. The project work shall be executed in the sequence indicated on the current accepted schedule.

Schedules shall show the order in which the Contractor proposes to carry out the work with logical links between time-scaled work activities, and calculations made using the critical path method to determine the controlling operation or operations. The Contractor is responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

The Contractor shall produce schedules using computer software and shall furnish compatible software for the Engineer's exclusive possession and use. The Contractor shall furnish network diagrams and schedule data as parts of each schedule submittal.

Schedules shall include, but not be limited to, applicable activities that show the following:

- A. Project characteristics, salient features, or interfaces, including those with outside entities, that could affect time of completion.
- B. Project start date, scheduled completion date and other milestones.
- C. Work performed by the Contractor, subcontractors and suppliers.
- D. Submittal development, delivery, review and approval, including those from the Contractor, subcontractors and suppliers.
- E. Procurement, delivery, installation and testing of materials, plants and equipment.
- F. Testing and settlement periods.
- G. Utility notification and relocation.
- H. Erection and removal of falsework and shoring.
- I. Major traffic stage switches.
- J. Finishing roadway and final cleanup.

Schedule activities shall include the following:

- A. A clear and legible description.
- B. Start and finish dates.

- C. A duration of not less than one working day, except for event activities, and not more than 20 working days, unless otherwise authorized by the Engineer.
- D. At least one predecessor and one successor activity, except for project start and finish milestones.
- E. Required constraints.

The Engineer's review and acceptance of schedules shall not waive any contract requirements and shall not relieve the Contractor of any obligation thereunder or responsibility for submitting complete and accurate information. Schedules that are rejected shall be corrected by the Contractor and resubmitted to the Engineer within 5 working days of notification by the Engineer, at which time a new review period of one week will begin.

Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Engineer, either the Contractor or the Engineer discover that any aspect of the schedule has an error or omission, it shall be corrected by the Contractor on the next update schedule.

COMPUTER SOFTWARE

The Contractor shall submit to the Engineer for approval a description of proposed software before delivery. The software shall be the current version of Primavera SureTrak Project Manager for Windows, or equal, and shall be compatible with Windows NT (version 4.0) operating system. If software other than SureTrak is proposed, it shall be capable of generating files that can be imported into SureTrak.

The Contractor shall furnish schedule software and all original software instruction manuals to the Engineer with submittal of the baseline schedule. The schedule software will be returned to the Contractor within 4 weeks of submittal of the final update schedule. The State will compensate the Contractor in conformance with the provisions in Section 4-1.03, "Extra Work," of the Standard Specifications for replacement of software which is damaged, lost or stolen after delivery to the Engineer.

NETWORK DIAGRAMS, REPORTS AND DATA

The Contractor shall include the following for each schedule submittal:

- A. Two sets of originally plotted, time-scaled network diagrams.
- B. One 1.44-megabyte 90 mm (3.5 inch) floppy diskette containing the schedule data.

The time-scaled network diagrams shall conform to the following:

- A. Show a continuous flow of information from left to right.
- B. Be based on early start and early finish dates of activities.
- C. Clearly show the primary paths of criticality using graphical presentation.
- D. Be prepared on B-size sheets, 280 mm x 430 mm (11 inch x 17 inch), or larger size.
- E. Include a title block and a timeline on each page.

BASELINE SCHEDULE

The Contractor shall submit to the Engineer a baseline schedule within 20 working days of approval of the contract. The Contractor shall allow 3 weeks for the Engineer's review after the baseline schedule and all support data are submitted. Beginning the week the baseline schedule is first submitted, the Contractor shall meet with the Engineer weekly to discuss and resolve schedule issues until the baseline schedule is accepted.

The baseline schedule shall include the entire scope of work and shall show how the Contractor plans to complete all work contemplated. The baseline schedule shall show the activities that define the critical path. Multiple critical paths and near-critical paths shall be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities shall be critical or near critical, unless otherwise authorized by the Engineer.

The baseline schedule shall not extend beyond the number of working days originally provided in these special provisions. The baseline schedule shall have a data date of the first working day of the contract and not include any completed work to date. The baseline schedule shall not attribute negative float or negative lag to any activity.

UPDATE SCHEDULE

The Contractor shall submit an update schedule and meet with the Engineer to review contract progress, on or before the first day of each month, beginning one month after the baseline schedule is accepted. The Contractor shall allow 2 weeks for the Engineer's review after the update schedule and all support data are submitted, except that the review period shall not start until any previous month's required schedule is accepted. Update schedules that are not accepted or rejected within the review period will be considered accepted by the Engineer.

The update schedule shall have a data date of the twenty-first day of the month or other date established by the Engineer. The update schedule shall show the status of work actually completed to date and the work yet to be performed as planned. In addition, the update schedule shall show any proposed schedule modifications including adding or deleting activities or changing activity constraints, durations or logic. The Contractor shall state in writing the reasons for any changes to activities and the critical path that result in a delay to the scheduled completion date compared to the previous accepted schedule.

FINAL UPDATE SCHEDULE

The Contractor shall submit a final update, as-built schedule with actual start and finish dates for the activities, within 30 days after completion of contract work. The Contractor shall provide a written certificate with this submittal signed by the Contractor's project manager and an officer of the company stating, "To my knowledge and belief, the enclosed final update schedule reflects the actual start and finish dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

RETENTION

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during each estimate period in which the Contractor fails to submit an acceptable schedule conforming to the requirements of these special provisions as determined by the Engineer. Schedule retentions will be released for payment on the next monthly estimate for partial payment following the date that acceptable schedules are submitted to the Engineer or as otherwise specified herein. Upon completion of all contract work and submittal of the final update schedule and certification, any remaining retained funds associated with this section, "Progress Schedule (Critical Path Method)", will be released for payment. Retentions held in conformance with this section shall be in addition to other retentions provided for in the contract. No interest will be due the Contractor on retention amounts.

PAYMENT

Full compensation for the required schedules and software shall be considered as included in the contract prices paid for the various items of work involved, and no additional compensation will be allowed therefor.

10-1.12 OBSTRUCTIONS

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

| Notification Center | Telephone Number |
|---|----------------------------------|
| Underground Service Alert-Northern California (USA) | 1-800-642-2444 1-800-227-2600 |
| Underground Service Alert-Southern California (USA) | 1-800-422-4133 1-800-227-2600 |

No excavation shall be performed within 1.2 m (4 feet) of the following utilities until the owner, or the owner's representative has located the facility by potholing, probing, or other means that will positively locate and identify the facility both horizontally and vertically. The utility company will be allowed 20 working days to perform this work.

The utility owner or the owner's representative shall be present whenever any excavation is performed within 1.2 meters of the following utilities:

| Owner | Utility | Location |
|-------|-----------------|----------------------------------|
| SDGE | 50 mm Gas Main | On E Street |
| SDGE | 50 mm Gas Main | On Bay Blvd |
| SDGE | 250 mm Oil Line | Running Along Proposed Bike Path |

10-1.13 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.14 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Flagging, signs, and all other traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Category 1 traffic control devices are defined as those devices that are small and lightweight (less than 45 kg), and have been in common use for many years. The devices shall be known to be crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Engineer, the Contractor shall provide written self-certification for crashworthiness of Category 1 traffic control devices. Self-certification shall be provided by the manufacturer or Contractor and shall include the following: date, Federal Aid number (if applicable), expenditure authorization, district, county, route and kilometer post of project limits; company name of certifying vendor, street address, city, state and zip code; printed name, signature and title of certifying person; and an indication of which Category 1 traffic control devices will be used on the project. The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 traffic control devices are defined as those items that are small and lightweight (less than 45 kg), that are not expected to produce significant vehicular velocity change, but may otherwise be potentially hazardous. Category 2 traffic control devices include: barricades and portable sign supports.

Category 2 devices purchased on or after October 1, 2000 shall be on the Federal Highway Administration (FHWA) Acceptable Crashworthy Category 2 Hardware for Work Zones list. This list is maintained by FHWA and can be located at the following internet address: <http://safety.fhwa.dot.gov/fourthlevel/hardware/listing.cfm?code=workzone>. The Department maintains a secondary list at the following internet address: <http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/files.htm>.

Category 2 devices that have not received FHWA acceptance, and were purchased before October 1, 2000, may continue to be used until they complete their useful service life or until January 1, 2003, whichever comes first. Category 2 devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer by the start of the project. The label shall be readable. After January 1, 2003, all Category 2 devices without a label shall not be used on the project.

Full compensation for providing self-certification for crashworthiness of Category 1 traffic control devices and labeling Category 2 devices as specified shall be considered as included in the prices paid for the various contract items of work requiring the use of the Category 1 or Category 2 traffic control devices and no additional compensation will be allowed therefor.

10-1.15 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Type II retroreflective sheeting shall not be used on construction area sign panels.

Attention is directed to "Construction Project Information Signs" of these special provisions regarding the number and type of construction project information signs to be furnished, erected, maintained, and removed and disposed of.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing excavation for construction area sign posts. The regional notification centers include, but are not limited to, the following:

| Notification Center | Telephone Number |
|---|----------------------------------|
| Underground Service Alert-Northern California (USA) | 1-800-642-2444 1-800-227-2600 |
| Underground Service Alert-Southern California (USA) | 1-800-422-4133 1-800-227-2600 |

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

10-1.16 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Attention is directed to "Traffic Plastic Drums," elsewhere in these special provisions regarding the use of plastic drums in place of portable delineators, cones or Type I or II barricades.

Lane closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic.

Whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed as shown on the plans.

Lanes shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor, if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. All other modifications will be made by contract change order.

| Chart No. 1 Multilane Lane Requirements | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------|---|---|---|---|---|---|---|---|---|---|------|----|---|---|---|---|---|---|---|---|---|----|----|----|---|
| Direction: Southbound SD - 5 | | | | | | | | | | | | Location: 0.60 km S. of Sweetwater River Bridge to 0.20 km N. of Sweetwater River Bridge | | | | | | | | | | | | | | | |
| FROM HOUR TO HOUR | | a.m. | | | | | | | | | | | p.m. | | | | | | | | | | | | | | |
| | | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Mondays through Thursdays | | 2 | 2 | 2 | 2 | 2 | | | | | 3 | 3 | 3 | 3 | A | A | A | | | | | | | A | A | 2 | 2 |
| Fridays | | 2 | 2 | 2 | 2 | 2 | | | | | 3 | 3 | 3 | 3 | A | A | A | | | | | | | | | | |
| Saturdays | | | | | 2 | 2 | 2 | 2 | 3 | 3 | A | A | A | A | | | | | | | | | | | | | |
| Sundays | | | | | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | A | A | A | A | A | A | A | | | | A | A | 2 | 2 | |
| Day before designated legal holiday | | 2 | 2 | 2 | 2 | 2 | | | | | 3 | 3 | 3 | 3 | A | A | A | | | | | | | | | | |
| Designated legal holidays | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Legend: <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">2</div> <div>Two adjacent lanes open in direction of travel</div> </div> <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">3</div> <div>Three adjacent lanes open in direction of travel</div> </div> <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">A</div> <div>Outside lane allowed to close</div> </div> <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> <div>No lane closure allowed</div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: KP: 14.44 / 15.24 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Chart No. 2 Shoulder Closure Requirements | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|------|---|---|---|---|---|---|---|---|---|---------------------------------------|------|----|---|---|---|---|---|---|---|---|---|----|----|----|
| Direction: Southbound SD - 5 | | | | | | | | | | | | Location: SB Off-ramp to "E" St. | | | | | | | | | | | | | | |
| FROM HOUR TO HOUR | | a.m. | | | | | | | | | | | p.m. | | | | | | | | | | | | | |
| | | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mondays through Thursdays | | S | S | S | S | S | S | | | | S | S | S | S | S | S | S | | | | | S | S | S | S | S |
| Fridays | | S | S | S | S | S | S | | | | S | S | S | S | S | S | | | | | | | | | | |
| Saturdays | | | | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | | | | | | | |
| Sundays | | | | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | | | S | S | S | S | S |
| Day before designated legal holiday | | S | S | S | S | S | S | | | | S | S | S | S | S | S | | | | | | | | | | |
| Designated legal holidays | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Legend: <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">S</div> <div>Shoulder may be closed</div> </div> <div style="display: flex; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> <div>No lane closure allowed</div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: KP: 14.700 | | | | | | | | | | | | | | | | | | | | | | | | | | |

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Chart No. 3
Ramp Lane Requirements

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|---|---|---|---|---|---|---|---|---|----|----|----|---|-----------|------------------------|---|---|---|---|---|---|----|----|----|--|--|--|--|
| Direction: | Southbound | | | | | | | | | | | | | | SD - 5 | | | | | | | | | | | | | | Location: | SB Off-ramp to "E" St. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | a.m. | | | | | | | | | | | | | | p.m. | | | | | | | | | | | | | | |
| FROM HOUR TO HOUR | | | | | | | | | | | | | | | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | | |
| Mondays through Thursdays | | | | | | | | | | | | | | | R | R | R | R | R | R | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | R | R | R | | | | |
| Fridays | | | | | | | | | | | | | | | R | R | R | R | R | R | | | | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | |
| Saturdays | | | | | | | | | | | | | | | | | | | R | R | R | R | R | R | R | | | | | | | | | | | | | | | | | | |
| Sundays | | | | | | | | | | | | | | | | | | | R | R | R | R | R | R | R | R | R | R | R | R | | | | | | | R | R | R | | | | |
| Day before designated legal holiday | | | | | | | | | | | | | | | R | R | R | R | R | R | | | | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | |
| Designated legal holidays | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Legend:

- R

 Ramp may be closed
- 1

 One lane open in direction of travel
- No work that interferes with public traffic will be allowed

REMARKS:

KP: 14.700

NOTE: When an Off-ramp is allowed to be closed, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning the public traffic of the ramp closure ahead.

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Chart No. 4
Ramp Lane Requirements

| | | | | |
|------------|-----------|---------|-----------|------------------------|
| Direction: | Westbound | SD - 54 | Location: | WB Off-ramp to "E" St. |
|------------|-----------|---------|-----------|------------------------|

Location: WB Off-ramp to "E" St.

[illegible]

Legend:

| | |
|---|---|
| R | Ramp may be closed |
| | No work that interferes with public traffic will be allowed |

| | |
|---|--------------------|
| R | Ramp may be closed |
|---|--------------------|

| | |
|--|---|
| | No work that interferes with public traffic will be allowed |
|--|---|

| |
|--|
| REMARKS: |
| KP: 0.003 |
| NOTE: When an Off-ramp is allowed to be closed, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning the public traffic of the ramp closure ahead. |

NOTE: When an Off-ramp is allowed to be closed, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning the public traffic of the ramp closure ahead.

NOTE: When an Off-ramp is allowed to be closed, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning the public traffic of the ramp closure ahead.

F= 0479K1113000RDI

| |
|---|
| Chart No. 5 Ramp Shoulder Closure Requirements |
|---|

| | | | | |
|------------|-----------|---------|-----------|---------------------------|
| Direction: | Westbound | SD - 54 | Location: | WB Off-ramp to "E" Street |
|------------|-----------|---------|-----------|---------------------------|

Location: WB Off-ramp to "E" Street

[illegible]

Legend:

| | |
|---|-----------------------------|
| S | Ramp shoulder may be closed |
|---|-----------------------------|

| | |
|---|-----------------------------|
| S | Ramp shoulder may be closed |
|---|-----------------------------|

| |
|-----------|
| REMARKS: |
| KP: 0.003 |

KP: 0.003

F= PB0479K1013001RDI

| Chart No. 6 Shoulder Closure Requirements | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------|---|---|---|---|---|---|---|---|---|----|----|---|---|---|---|---|---|---|---|---|---|----|----|----|--|
| Direction: Southbound SD - 54 | | | | | | | | | | | | | | Location: 0.60 km S. of Sweetwater River Bridge to 0.20 km N. of Sweetwater River Bridge | | | | | | | | | | | | | |
| FROM HOUR TO HOUR | | a.m. | | | | | | | | | | | | p.m. | | | | | | | | | | | | | |
| | | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Mondays through Thursdays | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Fridays | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Saturdays | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Sundays | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Day before designated legal holiday | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Designated legal holidays | | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | |
| Legend: <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin-right: 5px;">S</div> Shoulder may be closed </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KP: 14.44 / 15.24 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

10-1.17 CLOSURE REQUIREMENTS AND CONDITIONS

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

Amendments to the Closure Schedule, including adding additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of a planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

Ramps may be closed only if signed for closing 3 days in advance. The Contractor shall notify the Engineer not less than 5 calendar days prior to signing the ramp. If the ramp is not closed on the posted day, the closure shall be changed to allow 3 days advance notice before closure.

Consecutive on-ramps or off-ramps in the same direction of travel shall not be closed simultaneously unless otherwise provided in these special provisions.

CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

COMPENSATION

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

10-1.18 CONSTRUCTION ZONE ENHANCED ENFORCEMENT

Construction zone enhanced enforcement will be provided by the State as directed by the Engineer and in conformance with these special provisions. Construction zone enhanced enforcement shall consist of the presence of the California Highway Patrol (CHP) within and near the limits of construction during specified stages of work to control the movement of public traffic within the work zone. A total of 1090 hours of California Highway Patrol support is available.

The Contractor shall submit a schedule to the Engineer at least 15 days prior to the performance of work requiring construction zone enhanced enforcement. The schedule shall include all activities requiring construction zone enhanced enforcement and the estimated hours of CHP support required for each activity. The work shall be performed within the number of hours allocated for CHP support.

The Contractor may request additional CHP support for other times and in support of other work activities. The Contractor shall bear the costs and expenses for additional CHP support. The CHP shall be compensated at an agreed rate of \$55 per hour per CHP Officer. The agreed rate shall be considered full compensation for each hour, or portion thereof, that a CHP Officer is performing construction area enhanced enforcement. There will be no markup applied to any expenses connected with CHP support. The costs and expenses for requested additional CHP support will be deducted from moneys due to the Contractor.

The Engineer shall make all arrangements with the CHP for scheduled and requested additional construction zone enhanced enforcement.

CHP support shall be scheduled in compliance with the provisions in "Closure Requirements and Conditions" of these special provisions. The Contractor will be notified in writing of assigned CHP support when the Contractor is informed of the approval of requested closures.

Cancellations to previously approved closures scheduled to include construction zone enhancement enforcement shall be submitted in writing to the Engineer at least 36 hours prior to the time when the closure is to be in place. Written notices of cancellation for a closure shall be delivered to the Engineer between the hours of 7:00 a.m. and 3:00 p.m., Monday through Friday, excluding designated legal holidays.

Cancellations with less than the 36-hour written notice may result in charges from the CHP. The Contractor shall bear any costs and expenses resulting from cancellations with less than the 36 hour written notice, except cancellations due to weather or circumstances beyond the control of the Contractor, as determined by the Engineer. The CHP shall be compensated not less than \$50.00 per hour and no greater than 4 hours of overtime pay per CHP Officer scheduled to participate in the construction zone enhancement enforcement that is cancelled. The costs and expenses incurred for late cancellations will be deducted from moneys due or that may become due the Contractor.

The presence of the California Highway Patrol will not relieve the Contractor of responsibility of providing for the safety of the public in conformance with the requirements in Section 7-1.09, "Public Safety," nor relieve the Contractor from the responsibility for damage in conformance with the requirements in Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

10-1.19 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes and ramps in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining or removing components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing components when operated within a stationary lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on vehicles which are being used to place, maintain and remove components of a traffic control system and shall be in place before a lane closure requiring its use is completed.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane and ramp closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.20 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

Attention is directed to "Traffic Plastic Drums," elsewhere in these special provisions regarding the use of traffic plastic drums in place of portable delineators or cones.

GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Lane line or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic.

Work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE AND CENTERLINE DELINEATION

Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary raised pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary raised pavement markers placed on longitudinal intervals of not more than 7.3 m shall be used on lanes open to public traffic for a maximum of 14 days. Prior to the end of the 14 days, the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided at the Contractor's expense. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers used for temporary laneline and centerline delineation and for providing equivalent patterns of permanent traffic lines for these areas when required shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

10-1.21 PORTABLE CHANGEABLE MESSAGE SIGN

Portable changeable message signs shall be furnished, placed, operated, and maintained at those locations shown on the plans or where designated by the Engineer in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The Contractor shall have 2 portable changeable message signs on the project at all times.

Attention is directed to "Maintaining Traffic" of these special provisions regarding the use of the portable changeable message signs.

10-1.22 TEMPORARY RAILING

Temporary railing (Type K) shall be placed as shown on the plans, as specified in the Standard Specifications or these special provisions or where ordered by the Engineer and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

Temporary railing (Type K) shall conform to the details shown on Standard Plan T3. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Attention is directed to "Public Safety" and "Order of Work" of these special provisions.

Temporary railing (Type K) placed in conformance with the provisions in "Public Safety" of these special provisions will be neither measured nor paid for.

Temporary terminal section (Type K) for connecting temporary railing (Type K) to Type 50 concrete barrier shall consist of either new or undamaged used precast units, as shown on the plans. Fabricating, placing, painting, and removing the units shall conform to the provisions specified for temporary railing (Type K).

Closure plate for the temporary terminal section (Type K) shall be of a good commercial quality steel shaped to conform to cross section of the barriers. Mechanical expansion anchors for connecting closure plate to railings shall conform to the provisions specified for concrete anchorage devices in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications.

Temporary terminal section (Type K) will be measured by the unit from actual count in place.

The contract unit price paid for temporary terminal section (Type K) shall include full compensation for furnishing all labor, materials (including reinforcement and concrete anchorage devices), tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing, and removing temporary terminal section (Type K), complete in place, including excavation, backfill, grout and concrete, and connecting to concrete barrier, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.23 TRAFFIC PLASTIC DRUMS

Traffic plastic drums shall conform to the requirements for traffic control devices in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Traffic plastic drums shall be constructed of low-density polyethylene material and shall be flexible or collapsible upon impact by a vehicle. The traffic plastic drum shall have a weighted base that will separate from the drum. The base shall be of such shape as to preclude rolling upon impact by a vehicle. The base shall be of sufficient weight to maintain the drum in position and upright. The base or external ballast rings shall not exceed 101.6 mm in height, and drum rings shall not exceed 965.2 mm maximum in diameter. The base or external rings placed over and around the drum, resting on the pavement or ground shall contain the ballast for the drums. Ballast for drums shall be sand or water, except sand shall be used in areas susceptible to freezing. The base shall have drain holes to prevent the accumulation of water. Sand bags shall not be used as ballast for drums.

The body of the traffic plastic drum shall be of a fluorescent orange or predominately orange color. Drums shall be a minimum of 914.4 mm in height above the traveled way, and have at least an 457.2 mm minimum width, regardless of orientation.

The markings on drums shall be horizontal, circumferential, alternating orange and white reflective bands 101.6 to 152.4 mm wide. Each drum shall have a minimum of 2 orange and 2 white bands. The top of the uppermost reflective band shall be no lower than 152.4 mm from the top of the drum. Any non-reflective spaces between the bands shall not exceed 50.8 mm in width. The reflective sheeting shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Only one type of traffic plastic drum shall be used on the project. The type of traffic plastic drum proposed for use on the project shall be submitted to the Engineer for approval, prior to placement on the project.

In curvilinear alignment traffic plastic drums shall be used only on one side of the traveled way. Traffic plastic drums shall be placed on the alignment and location shown on the plans, or directed by the Engineer. Traffic plastic drums shall be placed uniformly, straight on tangent alignment and on a true arc on curved alignment. All layout work necessary to place the traffic plastic drums to the proper alignment shall be performed by the Contractor.

If traffic plastic drums are displaced or are not in an upright position, from any cause, the traffic plastic drums shall immediately be replaced or restored to their original location, in an upright position, by the Contractor.

At the option of the Contractor, where portable delineators, cones or Type I or II barricades are specified in the specifications or shown on the plans, traffic plastic drums may be used in place of those portable delineators, cones or Type I or II barricades.

At the completion of the project, traffic plastic drums shall become the property of the Contractor and removed from the site of the work.

Traffic plastic drums shall be installed as shown on the plans when temporary railing (Type K) is placed as required by "Public Safety" elsewhere in these special provisions.

Traffic plastic drums will be measured as units from actual count of the number of traffic plastic drum designated on the plans or ordered by the Engineer. After initial placement of traffic plastic drums, and if ordered by the Engineer, the traffic plastic drums shall be moved from location to location and the cost thereof will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Traffic plastic drums which are used as part of traffic control system in place of cones, delineators or barricades or which are used in accordance with the requirements of "Public Safety" elsewhere in these special provisions or which are placed in excess of the number specified or shown will not be included in the count of traffic plastic drums to be paid for.

The contract unit price paid for traffic plastic drums shall include full compensation for furnishing all labor, materials (including ballast), tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing and removing the traffic plastic drum, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.24 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these special provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety", "Order of Work", and "Temporary Railing" of these special provisions.

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III and Fitch Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076. Telephone 1-312-467-6750, FAX 1-800-770-6755
 - 1. Distributor (North): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828. Telephone 1-800-884-8274, FAX 1-916-387-9734
 - 2. Distributor (South): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805. Telephone 1-800-222-8274, FAX 1-714-937-1070
- B. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintero, San Clemente, CA 92672. Telephone 1-949 361-5663, FAX 1-949 361-9205
 - 1. Distributor (North): United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112. Telephone 1-408 287-4303, FAX 1-408 287-1929
 - 2. Distributor (South): Statewide Safety & Sign, Inc., P.O. Box 1440, Pismo Beach, CA 93448. Telephone 1-800-559-7080, FAX 1-805 929-5786

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

Temporary crash cushion modules will be measured by the unit as determined from the actual count of modules used in the work or ordered by the Engineer at each location. Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these special provisions and modules placed in excess of the number specified or shown will not be measured nor paid for.

Repairing modules damaged by public traffic will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Modules damaged beyond repair by public traffic, when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Modules replaced due to damage by public traffic will be measured and paid for as temporary crash cushion module.

If the Engineer orders a lateral move of the sand filled temporary crash cushions and the repositioning is not shown on the plans, moving the sand filled temporary crash cushion will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications and these temporary crash cushion modules will not be counted for payment in the new position.

The contract unit price paid for temporary crash cushion module shall include full compensation for furnishing all labor, materials (including sand, pallets or frames and marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing, installing, maintaining, moving, and resetting during a work period for access to the work, and removing from the site of the work when no longer required (including those damaged by public traffic) sand filled temporary crash cushion modules, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.25 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Residue from saw cutting operations shall be removed from the pavement surface by vacuuming or other approved method and shall not be allowed to flow across the pavement nor be left on the surface of the pavement. Residue from saw cutting operations shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside of the Highway Right of Way," of the Standard Specifications.

Full compensation for conforming to the requirements for the control, removal and disposal of residue resulting from saw cutting operations shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefor.

Plans of the adjacent existing State Highway bridges, bridge numbers 57-0845F and 57-0946F, may be requested by fax from the Office of Structure Maintenance and Investigations, 1801 30th Street, Sacramento, California, Fax (916) 227-8357, and are available at the Office of Structure Maintenance and Investigations, Los Angeles, California, Telephone (213) 897-6156.

Plans of the existing bridges available to the Contractor are reproductions of the original contract plans with significant changes noted and working drawings and do not necessarily show normal construction tolerances and variances. Where dimensions of new construction required by this contract are dependent on the dimensions of the existing bridges, the Contractor shall verify the controlling field dimensions and shall be responsible for adjusting dimensions of the work to fit existing conditions.

REMOVE FENCE

Existing fence, including post footings, where shown on the plans, to be removed shall be removed and disposed of. Post footings which do not conflict with the installation of new construction may remain in place.

RELOCATE FENCE

Existing fences, shall be removed and relocated to the new locations, where shown on the plans. Post footings which do not conflict with the installation of new construction may remain in place.

REMOVE ASPHALT CONCRETE DIKE

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed.

Prior to removing the dike, the outside edge of the asphalt concrete to remain in place shall be cut on a neat line to a minimum depth of 50 mm.

At the Contractor's option, dikes may be removed by the cold plane method. When the cold plane method is selected, saw cutting the outside edge to a neat line will not be required.

The dike shall be removed in such a manner that the surfacing which is to remain in place is not damaged.

The dike shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

REMOVE ROADSIDE SIGN

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

RELOCATE ROADSIDE SIGN

Existing roadside signs shall be removed and relocated to the new locations shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

ADJUST MANHOLE

Frames and covers of existing manholes or other facilities shall be adjusted to grade in conformance with the provisions in Section 15-2.05, "Reconstruction," of the Standard Specifications.

REMOVE CONCRETE

Concrete, where shown on the plans to be removed, shall be removed.

The pay quantities of remove slope paving will be measured by the cubic meter, measured before and during removal operations.

Removing concrete barrier will be measured by the meter, measured along the barrier before removal operations.

Concrete removed shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

10-1.26 CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

At locations where there is no grading adjacent to a bridge or other structure, clearing and grubbing of vegetation shall be limited to 1.5 m outside the physical limits of the bridge or structure.

Existing vegetation outside the areas to be cleared and grubbed shall be protected from injury or damage resulting from the Contractor's operations.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

10-1.27 WATERING

Developing a water supply and applying watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications.

10-1.28 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

At the location and to the limits shown on the plans for foundation treatment, material below the bottom of retaining wall footings, shall be removed and replaced with structure backfill (retaining wall). The relative compaction shall not be less than 95 percent. Removal of the material will be measured and paid for as structure excavation (retaining wall) and furnishing, placing and compacting the replacement material will be measured and paid for as structure backfill (retaining wall).

No ponding or jetting of backfill will be allowed.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

"Weep Hole and Geocomposite shall conform to the details shown on the plans and the following:

A. Attention is directed to "Engineering Fabrics" under "Materials" of these special provisions.

- B. Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa.
- C. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these special provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates for externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.
- D. Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.
- E. The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.
- F. The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.
- G. The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.
- H. Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a minimum 150-mm overlap.
- I. Plastic pipe shall conform to the provisions for edge drain pipe and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.
- J. Treated permeable base to be placed around the slotted plastic pipe at the bottom of the geocomposite drain shall be cement treated permeable base conforming to the provisions for cement treated permeable base in Section 29, "Treated Permeable Bases," of the Standard Specifications and these special provisions.
- K. The treated permeable base shall be enclosed with a high density polyethylene sheet or PVC geomembrane, not less than 250 μ m thick, which is bonded with a suitable adhesive to the concrete and geocomposite drain. Surfaces to receive the polyethylene sheet shall be cleaned before applying the adhesive. The treated permeable base shall be compacted with a vibrating shoe type compactor.

If structure excavation or structure backfill involved in bridges is not otherwise designated by type, and payment for the structure excavation or structure backfill has not otherwise been provided for in the Standard Specifications or these special provisions, the structure excavation or structure backfill will be paid for at the contract price per cubic meter for structure excavation (bridge) or structure backfill (bridge).

Full compensation for furnishing and installing weep hole and geocomposite drain, (including filter fabric, plastic pipe, and treated permeable base with polyethylene sheeting), shall be considered as included in the contract price paid per cubic meter for structure backfill of the types listed in the Engineer's Estimate and no additional compensation will be allowed therefor.

10-1.29 STRUCTURE BACKFILL (LIGHT WEIGHT, RETAINING WALL)

Structure backfill (light weight, retaining wall) shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Structure backfill (light weight, retaining wall) shall consist of a rotary kiln expanded shale aggregate of the extruded type or a processed, naturally-occurring volcanic aggregate.

Structure backfill (light weight, retaining wall) grading shall be as specified in these special provisions.

Structure backfill (light weight, retaining wall) material, when deposited in place, shall conform to the following grading and quality requirements:

Grading Requirements

| Sieve Sizes | Percentage Passing |
|-------------|--------------------|
| 37.5-mm | 100 |
| 25-mm | 95 - 100 |
| 19-mm | 90 - 100 |
| 9.5-mm | 15 - 85 |
| 75-μm | 0 - 9 |

Grading will be determined in conformance with the requirements of California Test 202, except shaking in the sieves shall be limited to 5 minutes.

Quality Requirements

| Test | Requirement |
|----------------------|-------------|
| Resistance (R-Value) | 50 min |
| Durability Index | 35 min |

Structure backfill (light weight, retaining wall) shall have a minimum calculated saturated surface dry unit mass of 1100 kg/m³ and a maximum calculated saturated surface dry unit mass of 1260 kg/m³. The saturated surface dry unit mass shall be calculated using the dry loose unit weight and the absorption of the coarse and fine aggregates. Dry loose unit weight shall be determined in conformance with the requirements in California Test Method 212, using test procedure (b) Compaction Method (by jiggling). Absorption of the coarse and fine aggregates shall be determined in conformance with the requirements in California Test Methods 206 and 207, except that the samples shall be oven dry before soaking and shall be soaked for 24 hours plus or minus 30 minutes. Saturated surface dry unit weight shall be calculated as follows:

1. multiply the percent coarse aggregate by the absorption of the coarse aggregate;
2. multiply the percent fine aggregate by the absorption of the fine aggregate;
3. add the two values from 1. and 2. and divide by 10000;
4. add one (1) to the result from 3. and multiply by the dry loose unit weight.

Structure backfill (light weight, retaining wall) shall be placed and compacted to the designated dimensions in conformance with the provisions in Sections 19-1.03, "Grade Tolerance," and 19-6, "Embankment Construction," of the Standard Specifications. The provisions in Section 19-5, "Compaction," of the Standard Specifications shall not apply.

Initial layers of structure backfill (light weight, retaining wall) may be placed by end dumping from trucks, or by any other method approved by the Engineer.

Structure backfill (light weight, retaining wall) shall be spread or placed in such manner that will prevent bulking of the material and minimize particle breakdown. Structure backfill (light weight, retaining wall) shall be compacted in uniform layers not to exceed 0.2-m thickness before compaction. Compaction shall be obtained by a minimum of 3 complete coverage passes using smooth drum steel roller compaction equipment imposing contact force of 1,850 kg per-meter-width of the roller face. Track type equipment which imposes the equivalent contact pressure as that specified for steel drum rollers, as determined by the Engineer, may be used provided the 3 complete coverages of the tracks of the track type equipment are achieved. Sufficient moisture treatment shall be made to aid the compactive effort. Compaction using pneumatic-tired equipment or compaction within trenches or other limited-access areas, or compaction in areas of low confining pressure, shall be by a method approved by the Engineer.

When alternative compaction equipment and methods of compaction (including use of pneumatic-tired equipment in trenches, in limited-access areas, and areas of low confining pressure) are proposed by the Contractor, a test site placing and compacting lightweight aggregate material shall be constructed. The alternative compaction equipment and methods of compaction shall not be used until, evaluation of the test site by the Engineer and the alternative methods and equipment have been approved by the Engineer.

Quantities of structure backfill (light weight, retaining wall) will be paid for by the cubic meter calculated on the basis of the mass, measured in place in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications divided by the 95 percent of the dry unit mass measured in conformance with the requirements in California Test Method 212, using test procedure (b) Compaction Method (by jiggling).

The contract price paid per cubic meter for structure backfill (light weight, retaining wall) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing structure backfill (light weight, retaining wall), complete in place (including constructing and removing any test sites required), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.30 CONTROLLED LOW STRENGTH MATERIAL

Controlled low strength material shall consist of a workable mixture of aggregate, cementitious materials, and water and shall conform to the provisions for slurry cement backfill in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications and these special provisions.

At the option of the Contractor, controlled low strength material may be used as structure backfill for pipe culverts, except that controlled low strength material shall not be used as structure backfill for aluminum and aluminum-coated culverts nor for culverts having a diameter or span greater than 6.1 m.

When controlled low strength material is used for structure backfill, the width of the excavation shown on the plans may be reduced so that the clear distance between the outside of the pipe and the side of the excavation, on each side of the pipe, is a minimum of 300 mm. This minimum may be reduced to 150 mm when the height of cover is less than or equal to 6.1 m or the pipe diameter or span is less than 1050 mm.

Controlled low strength material in new construction shall not be permanently placed higher than the basement soil. For trenches in existing pavements, permanent placement shall be no higher than the bottom of the existing pavement permeable drainage layer. If a drainage layer does not exist, permanent placement in existing pavements shall be no higher than 25 mm below the bottom of the existing asphalt concrete surfacing or no higher than the top of base below the existing portland cement concrete pavement. The minimum height that controlled low strength material shall be placed, relative to the culvert invert, is 0.5 diameter or 0.5 height for rigid culverts and 0.7 diameter or 0.7 height for flexible culverts.

When controlled low strength material is proposed for use, the Contractor shall submit a mix design and test data to the Engineer for approval prior to excavating the trench for which controlled low strength material is proposed for use. The test data and mix design shall provide for the following:

- A. A 28-day compressive strength between 345 kPa and 690 kPa for pipe culverts having a height of cover of 6.1 m or less and a minimum 28-day compressive strength of 690 kPa for pipe culverts having a height of cover greater than 6.1 m. Compressive strength shall be determined in conformance with the requirements in ASTM Designation: D 4832.
- B. When controlled low strength material is used as structure backfill for pipe culverts, the sections of pipe culvert in contact with the controlled low strength material shall conform to the requirements of Chapter 850 of the Highway Design Manual using the minimum resistivity, pH, chloride content, and sulfate content of the hardened controlled low strength material. Minimum resistivity and pH shall be determined in conformance with the requirements of California Test 643. The chloride content shall be determined in conformance with the requirements of California Test 422 and the sulfate content shall be determined in conformance with the requirements of California Test 417.
- C. Cement shall be any type of portland cement conforming to the requirements in ASTM Designation: C 150; or any type of blended hydraulic cement conforming to the requirements in ASTM Designation: C 595M or the physical requirements in ASTM Designation: C 1157M. Testing of cement will not be required.
- D. Admixtures may be used in conformance with the provisions in Section 90-4, "Admixtures," of the Standard Specifications. Chemical admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined in conformance with the requirements of California Test 415, shall not be used. If an air-entraining admixture is used, the maximum air content shall be limited to 20 percent. Mineral admixtures shall be used at the Contractor's option.

Materials for controlled low strength material shall be thoroughly machine-mixed in a pugmill, rotary drum or other approved mixer. Mixing shall continue until the cementitious material and water are thoroughly dispersed throughout the material. Controlled low strength material shall be placed in the work within 3 hours after introduction of the cement to the aggregates.

When controlled low strength material is to be placed within the traveled way or otherwise to be covered by paving or embankment materials, the material shall achieve a maximum indentation diameter of 76 mm prior to covering and opening to public traffic. Penetration resistance shall be measured in conformance with the requirements in ASTM Designation: D 6024.

Controlled low strength material used as structure backfill for pipe culverts will be considered structure backfill for compensation purposes.

10-1.31 EROSION CONTROL (TYPE D)

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to embankment and excavation slopes and other areas disturbed by construction activities.

If the slope on which the erosion control is to be placed is finished during the rainy season as specified in "Water Pollution Control" of these special provisions, the erosion control shall be applied immediately to the slope.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Non-Legume Seed

Non-legume seed shall consist of the following:

| NON-LEGUME SEED | | |
|--|----------------------------------|---|
| Botanical Name (Common Name) | Percent Germination (Minimum) | Kilograms Pure Live Seed Per Hectare (Slope Measurement) |
| Artemesia californica (California Sagebrush) | 25 | .25 |
| Atriplex canescens (Four-wing Salt Bush) | 25 | 10 |
| Camissonia cheiranthefolia suffruticosa (Beach Evening Primrose) | 50 | 1 |
| Eriogonlum fasciculatum (California Buckwheat) | 10 | 2 |
| Heteromeles arbutifolia (Toyon) | 20 | 10 |

Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications and shall have a guaranteed chemical analysis of 6 percent nitrogen, 20 percent phosphoric acid and 20 percent water soluble potash.

Bonded Fiber Matrix

Bonded Fiber Matrix "(BFM)" shall be a hydraulically applied erosion control blanket comprised of wood fibers and stabilizing emulsion.

The matrix shall be pre-mixed and pre-packaged by the manufacturer and composed of wood fiber, with a minimum 25 percent of the fibers averaging 10 mm long. Fibers shall be colored with a water-soluble, non-toxic dye. The matrix shall disperse rapidly in water and remain in uniform suspension under agitation to form an homogeneous slurry.

Bonded fiber matrix, when applied, shall form a continuous moisture-holding mat with no hole greater than one mm in size, shall have no gaps between mat and soil, and have a water holding capacity of 10 liters per kilogram of matrix. Bonded fiber matrix shall not inhibit seed germination and growth.

Possible sources and acceptable BFM products available:

Conwed 3000

Available at: Hydroscape

(619) 440.4703

435 Marshall Avenue, El Cajon, CA 92020

Eco-Aegis Rep: Dave Kopp (509) 220.2473
 Available at: Ewing Irrigation (619) 426.5200
 591 C Street, Chula Vista, CA 91910
 Kalmia Sales (909) 693.5512
 P.O. Box 1165, Temecula, CA 92593
 S&S Seeds,
 P.O. Box 1275,
 Carpinteria, CA (805) 684.0436

Soil Guard Rep: Lucinda J. Dustin (916) 564.6717
 Available at: Verdant Resources, LLC
 3026 Swallows Nest Drive
 Sacramento, CA 95833

APPLICATION

Erosion control materials shall be applied in two separate applications in the following sequence:

- A. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

| Material | Kilograms Per Hectare (Slope Measurement) |
|---------------------|--|
| Bonded Fiber Matrix | 2250 |
| Non-Legume Seed | 23.25 |

| Material | Kilograms Per Hectare (Slope Measurement) |
|---------------------|--|
| Bonded Fiber Matrix | 2250 |
| Non-Legume Seed | 23.25 |

- B. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

| Material | Kilograms Per Hectare (Slope Measurement) |
|-----------------------|--|
| Bonded Fiber Matrix | 2250 |
| Commercial Fertilizer | 50 |

The ratio of total water to bonded fiber matrix in the mixture shall be as recommended by the manufacturer.
 The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

10-1.32 IRRIGATION CROSSOVERS

Irrigation crossovers shall conform to the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications and these special provisions.

Conduits shall be placed in open trenches in conformance with the provisions in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications.

Conduits shall be corrugated high density polyethylene (CHDPE) pipe. Corrugated high density polyethylene pipe shall conform to the requirements in ASTM Designation: F 405 or F 667, or AASHTO Designation: M 252 or M 294 and shall be Type S. Couplings and fittings shall be as recommended by the pipe manufacturer.

Water line crossovers shall conform to the provisions in Section 20-5.03C, "Water Line Crossovers," of the Standard Specifications.

Sprinkler control crossovers shall conform to the provisions in Section 20-5.027D, "Sprinkler Control Crossovers," of the Standard Specifications.

Installation of pull boxes shall conform to the provisions in Section 20-5.027I, "Conductors, Electrical Conduit and Pull Boxes," of the Standard Specifications. When no conductors are installed in electrical conduits, pull boxes for irrigation crossovers shall be installed on a foundation of compacted soil.

10-1.33 EXTEND IRRIGATION CROSSOVERS

Extend existing irrigation crossovers shall conform to the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications and these special provisions.

Extend irrigation crossovers shall include conduit, water line crossover, and sprinkler control crossover extensions and appurtenances, locating existing irrigation crossovers and pressure testing existing and new water line crossovers. The sizes of conduit, water line crossover, and sprinkler control crossover extensions shall be as shown on the plans.

Before work is started in an area where an existing irrigation crossover conduit is to be extended, the existing conduit shall be located by the Contractor. When exploratory holes are used to locate the existing conduit, the exploratory holes shall be excavated in conformance with the provisions in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications.

If debris is encountered in the ends of conduits to be extended, the debris shall be removed prior to extending conduits. Removal of debris within the first meter in the conduits shall be at the Contractor's expense. If debris is encountered in the conduit more than one meter from the ends of the conduits to be extended, the additional debris shall be removed as directed by the Engineer and will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Prior to installation of water line crossover extensions, the existing water lines shall be pressure tested for leakage in conformance with the provisions in Section 20-5.03H, "Pressure Testing," of the Standard Specifications. Repairs to the existing water line crossover, when ordered by the Engineer, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Conduit extensions shall be corrugated high density polyethylene (CHDPE) pipe.

Water line crossover extensions shall be plastic pipe (PR 315) (supply line).

Sprinkler control crossover extensions shall be Type 3 electrical conduit.

Conductors shall be removed from existing sprinkler control crossovers to be extended.

After installation of the sprinkler control crossover extensions, new conductors shall be installed without splices in existing and extended sprinkler control crossovers. New conductors shall match the removed conductors in color and size and shall be spliced to the existing conductors in adjacent pull boxes. After the new conductors are installed, the conductors shall be tested in the same manner specified for traffic signal, sign illumination, and lighting circuits in conformance with the provisions in Section 86-2.14B, "Field Testing," of the Standard Specifications.

After water line crossover extensions have been installed, existing and extended water line crossovers shall be retested for leakage in conformance with the provisions in Section 20-5.03H, "Pressure Testing," of the Standard Specifications. Leaks that develop shall be repaired at the Contractor's expense and the water line crossovers shall be retested until a satisfactory pressure test is achieved.

10-1.34 IMPORTED TOPSOIL

Imported topsoil shall conform to the provisions in Section 20-2, "Materials," and Section 20-3, "Erosion Control," of the Standard Specifications.

10-1.35 AGGREGATE BASE

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

The restriction that the amount of reclaimed material included in Class 2 aggregate base not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 2 aggregate base may include reclaimed glass. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

10-1.36 ASPHALT CONCRETE

Asphalt concrete shall be Type A and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

Asphalt concrete shall be produced from commercial quality asphalt and aggregates. The spreading and compacting provisions in Section 39-6.02, "Spreading," and Section 39-6.03, "Compacting," of the Standard Specifications will not apply.

The asphalt concrete shall conform to the following requirements:

- A. Asphalt concrete shall be produced at a central mixing plant.
- B. Aggregate shall conform to the 12.5-mm, Maximum, coarse grading conforming to the provisions in Section 39-2.02, "Aggregate," of the Standard Specifications.

- C. The amount of asphalt binder to be mixed with the aggregate shall be between 4 percent and 7 percent by mass of the dry aggregate as determined by the Engineer. The fifth through eighth paragraphs in Section 39-3.03, "Proportioning," of the Standard Specifications shall not apply.
- D. Asphalt concrete shall be spread in one operation with a self-propelled spreader ready for compaction without further shaping.
- E. Compaction shall be performed with a tandem roller weighing not less than 7.2 tonnes.
- F. The finished surface shall meet the straightedge provisions in Section 39-6.03, "Compacting," of the Standard Specifications.

A paint binder will not be required.

Aggregate for asphalt concrete dikes shall be in conformance with the provisions for 9.5-mm Maximum grading in Section 39-2.02, "Aggregate," of the Standard Specifications.

10-1.37 PILING

GENERAL

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Unless otherwise specified, welding of any work performed in conformance with the provisions in Section 49, "Piling," of the Standard Specifications, shall be in conformance with the requirements in AWS D1.1.

Foundation recommendations are included in the "Information Handout" available to the Contractor as provided for in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Attention is directed to "Welding" of these special provisions.

Section 49-1.05, "Driving Equipment," of the Standard Specifications is amended by adding the following paragraph after the seventh paragraph:

The use of followers or underwater hammers for driving piles will be permitted if authorized in writing by the Engineer. When a follower or underwater hammer is used, its efficiency shall be verified by furnishing the first pile in each bent or footing sufficiently long and driving the pile without the use of a follower or underwater hammer.

Difficult pile installation is anticipated due to the presence of tidal flow fluctuation and low overhead clearance.

The first and second paragraphs of Section 49-4.01, "Description," of the Standard Specifications are amended to read:

- Cast-in-place concrete piles shall consist of one of the following:
 - A. Steel shells driven permanently to the required bearing value and penetration and filled with concrete.
 - B. Steel casings installed permanently to the required penetration and filled with concrete.
 - C. Drilled holes filled with concrete.
 - D. Rock sockets filled with concrete.
- The drilling of holes shall conform to the provisions in these specifications. Concrete filling for cast-in-place concrete piles is designated by compressive strength and shall have a minimum 28-day compressive strength of 25 MPa. At the option of the Contractor, the combined aggregate grading for the concrete shall be either the 25-mm maximum grading, the 12.5-mm maximum grading, or the 9.5-mm maximum grading. Concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," and Section 51, "Concrete Structures." Reinforcement shall conform to the provisions in Section 52, "Reinforcement."

Jetting and Drilling

Jetting or drilling to obtain the specified penetration in conformance with the provisions in Section 49-1.05, "Driving Equipment," of the Standard Specifications shall not be used for driven type piles.

STEEL PIPE PILING

General

Steel pipe piling shall consist of steel shells for closed ended cast-in-steel-shell concrete piling. Steel pipe piling shall conform to the provisions in Section 49-5, "Steel Piles," of the Standard Specifications and these special provisions.

Wherever reference is made to the following American Petroleum Institute (API) specifications in the Standard Specifications, on the project plans, or in these special provisions, the year of adoption for these specifications shall be as follows:

| API Codes | Year of Adoption |
|-----------|------------------|
| API 2B | 1990 |
| API 5L | 1995 |

All requirements of the codes listed above shall apply unless specified otherwise in the Standard Specifications, on the plans or in these special provisions.

Only steel pipe pile seam welds may be made by the electric resistance welding method. Such welds shall be welded in conformance with the requirements in API 5L and any amendments to API 5L in the Standard Specifications or these special provisions.

Seams in steel pipe piles made by submerged arc welding may be welded in conformance with the requirements in API 5L and any amendments to API 5L in the Standard Specifications or these special provisions.

Handling devices may be attached to steel pipe piling. Welds attaching these devices shall be aligned parallel to the axis of the pile and shall conform to the requirements for field welding specified herein. Permanent bolted connections shall be corrosion resistant. Prior to making attachments, the Contractor shall submit a plan to the Engineer that includes the locations, handling and fitting device details, and connection details. Attachments shall not be made to the steel pipe piling until the plan is approved in writing by the Engineer. The Engineer shall have 7 days to review the plan. Should the Engineer fail to complete the review within 7 days, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the plan, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Each length of steel pipe piling shall be marked in conformance with the requirements in ASTM Designation: A 252.

For steel pipe piling, including bar reinforcement in the piling, the Engineer shall be allowed 48 hours to review the "Welding Report," specified in "Welding Quality Control" of these special provisions, and respond in writing after the required items have been received. No field welded steel pipe piling shall be installed, and no reinforcement in the piling shall be encased in concrete until the Engineer has approved the above requirements in writing. Should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

At the Contractor's option, a steel pipe pile may be re-tapped to prevent pile set-up; however, the field welded splice shall remain at least one meter above the work platform until that splice is approved in writing by the Engineer.

Manufactured Steel Pipe

Manufactured steel pipe is defined as pipe produced at a permanent facility where an automatic welding process, electric resistance welder, or seamless pipe operation is used in conformance with ASTM Designations: A 252, A 53, A 135, A 139, API 5L, or AWWA C200; where this steel pipe can be produced in lengths at least 9 m long without a circumferential splice; and where this manufacturing can be done on a daily basis. Manufactured steel pipe is not a specifically engineered product. (i.e. Manufactured steel pipe is an off-the-shelf item.)

Manufactured steel pipe used for steel pipe piling shall conform to the following requirements:

- A. The outside circumference of the steel pipe piling end shall not vary by more than 10 mm from that corresponding to the diameter shown on the plans.
- B. The maximum allowable misalignment for adjacent steel pipe pile edges to be welded shall be 0.1875 times the wall thickness, but not more than 1.6 mm.
- C. Steel pipe pile straightness shall conform to the requirements in API 5L, Section 7.6, "Straightness."
- D. Welds made at a permanent manufacturing facility shall be made by either an automatic welding process or an electric resistance welding process.

Fabricated Steel Pipe

Fabricated steel pipe is defined as pipe produced at a permanent facility where a variety of steel fabrication including roll forming and welding steel plate into pipe is performed, where this pipe is at least 19 mm in wall thickness, where this pipe is produced in conformance with API 2B, and where this fabrication can be done on a daily basis. Fabricated steel pipe is a specifically engineered product. (i.e. Fabricated steel pipe is engineered for a specific project.)

Fabricated steel pipe used for steel pipe piling shall conform to API 2B and the following requirements:

- A. An API site license and API monogram are not required.
- B. Weld filler metal shall conform to the requirements of AWS D1.5 for the welding of ASTM Designation: A 709, Grade 50 steel, except that the qualification, pretest, and verification test requirements need not be conducted if certified test reports are provided for the consumables to be used.

Field Welding

Field welding of steel piling is defined as welding performed after the certificate of compliance has been furnished by the manufacturer or fabricator and shall conform to the following requirements:

- A. Match marking of pipe ends at the manufacturing or fabrication facility is recommended for piling to ensure weld joint fit-up. Prior to positioning any 2 sections of steel pipe to be spliced by field welding, including those that have been match marked at the manufacturing or fabrication facility, the Contractor shall equalize the offsets of the pipe ends to be joined and match mark the pipe ends.
- B. Welds made in the flat position or vertical position (where the longitudinal pipe axis is horizontal) shall be single-vee groove welds. Welds made in the horizontal position (where the longitudinal pipe axis is vertical) shall be single-bevel groove welds. Joint fit-ups shall conform to the requirements for tubular sections in AWS D1.1 and these special provisions.
- C. The minimum thickness of the backing ring shall be 6 mm, and the ring shall be continuous. Splices in the backing ring shall be made by complete penetration welds. These welds shall be completed and inspected prior to final insertion into a pipe end. Attachment of backing rings to pipe ends shall be done using the minimum size and spacing of tack welds that will securely hold the backing ring in place. Tack welding shall be done in the root area of the weld splice. Cracked tack welds shall be removed and replaced prior to subsequent weld passes. The gap between the backing ring and the steel pipe piling wall shall be no greater than 2 mm. One localized portion of the splice, that is equal to or less than a length that is 20 percent of the outside circumference of the pipe, as determined by the Engineer, may be offset by a gap equal to or less than 6 mm provided that this localized portion is first seal welded using shielded metal arc E7016 or E7018 electrodes. The Contractor shall mark this localized portion so that it can be referenced during any required nondestructive testing (NDT). Backing rings shall have a minimum width of 1 1/2 times the thickness of the pile to be welded so that they will not interfere with the interpretation of the NDT.
- D. For steel pipe with an outside diameter greater than 1.1 m, and with a wall thickness greater than 25.4 mm, the root opening tolerances may be increased to a maximum of 5 mm over the specified tolerances.
- E. Weld filler metal shall conform to the requirements shown in AWS D1.5 for the welding of ASTM Designation: A 709, Grade 50 steel, except that the qualification, pretest, and verification test requirements need not be conducted if certified test reports are provided for the consumables to be used.
- F. For field welding, including attaching backing rings and making repairs, the preheat and interpass temperature shall be in conformance with AWS D1.1, Section 3.5, "Minimum Preheat and Interpass Temperature Requirements," and with Table 3.2, Category C; and the minimum preheat and interpass temperature shall be 66°C, regardless of the pipe pile wall thickness or steel grade. In the event welding is disrupted, preheating to 66°C must occur before welding is resumed.
- G. Welds shall not be water quenched. Welds shall be allowed to cool unassisted.

Radiographic, magnetic particle, or ultrasonic testing shall be used to assure soundness of backing rings in conformance with the requirements in AWS D1.1, Section 6.

MEASUREMENT AND PAYMENT (PILING)

Measurement and payment for the various types and classes of piles shall conform to the provisions in Sections 49-6.01, "Measurement," and 49-6.02, "Payment," of the Standard Specifications and these special provisions.

The first paragraph of Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- Timber, steel, and precast prestressed concrete piles, and cast-in-place concrete piles consisting of driven shells filled with concrete, will be paid for at the contract price per meter for furnish piling and the contract unit price for drive pile.

The third paragraph of Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- The contract price paid per meter for cast-in-drilled-hole concrete piling shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in drilling holes, disposing of material resulting from drilling holes, temporarily casing holes and removing water when necessary,

furnishing and placing concrete and reinforcement, and constructing reinforced concrete extensions, complete in place, to the required penetration, as shown on the plans, as specified in these specifications and in the special provisions, and as directed by the Engineer.

The seventh paragraph of Section 49-6.02, "Payment," of the Standard Specifications is amended to read:

- The contract unit price paid for drive pile shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in driving timber, concrete, and steel piles, driving steel shells for cast-in-place concrete piles, placing filling materials for cast-in-place concrete piles, and cutting off piles, all complete in place to the required bearing and penetration, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

Full compensation for conforming to the provisions in "Steel Pipe Piling" of these special provisions shall be considered as included in the contract prices paid for the various items of work involved, and no additional compensation will be allowed therefor.

10-1.38 PRESTRESSING CONCRETE

Prestressing concrete shall conform to the provisions in Section 50, "Prestressing Concrete," of the Standard Specifications and these special provisions.

The tenth paragraph of Section 50-1.05, "Prestressing Steel," of the Standard Specifications is amended to read:

- Prestressing steel for post-tensioning which is installed in members prior to placing and curing of the concrete, shall be continuously protected against rust or other corrosion, until grouted, by means of a corrosion inhibitor placed in the ducts or applied to the steel in the duct. The corrosion inhibitor shall conform to the provisions in Section 50-1.05, "Prestressing Steel," of the Standard Specifications.

The third paragraph of Section 50-1.08, "Prestressing," of the Standard Specifications is amended to read:

- Working force and working stress will be considered as the force and stress remaining in the prestressing steel after all losses, including creep and shrinkage of concrete, elastic compression of concrete, creep of steel, losses in post-tensioned prestressing steel due to sequence of stressing, friction and take up of anchorages, and all other losses peculiar to the method or system of prestressing have taken place or have been provided for.

The number of working drawings to be submitted for initial review shall be 6 sets.

The details shown on the plans for cast-in-place prestressed box girder bridges are based on a bonded full length draped tendon prestressing system. For these bridges the Contractor may, in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications, propose an alternative prestressing system utilizing bonded partial length tendons provided the proposed system and associated details meet the following requirements:

- A. The proposed system and details shall provide moment and shear resistances at least equal to those used for the design of the structure shown on the plans.
- B. The concrete strength shall not be less than that shown on the plans.
- C. Not less than 35 percent of the total prestressing force at any section shall be provided by full length draped tendons.
- D. Anchorage blocks for partial length tendons shall be located so that the blocks will not interfere with the placement of the utility facilities shown on the plans or of any future utilities to be placed through openings shown on the plans.
- E. Temporary prestressing tendons, if used, shall be detensioned, and the temporary ducts shall be filled with grout before completion of the work. Temporary tendons shall be either removed or fully encased in grout before completion of the work.
- F. All details of the proposed system, including supporting checked calculations, shall be included in the drawings submitted in conformance with the provisions in Section 50-1.02, "Drawings," of the Standard Specifications.

Moments and shears for loads used in the design shown on the plans will be made available to the Contractor upon written request to the Engineer.

10-1.39 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

Shotcrete shall not be used as an alternative construction method for reinforced concrete members.

The first paragraph of Section 51-1.20, "Sidewalks, Curbs and Stairways on Structures," of the Standard Specifications is amended to read:

- The concrete shall be finished in conformance with the provisions for finishing surfaces in Section 73-1.06, "Sidewalk, Gutter Depression, Island Paving, Curb Ramp (Wheelchair Ramp), and Driveway Construction," except that surfaces shall not be marked.

FALSEWORK

Falsework shall be designed and constructed in conformance with the requirements in Section 51-1.06, "Falsework," of the Standard Specifications and these special provisions.

Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended to read:

51-1.06A Falsework Design and Drawings

- The Contractor shall submit to the Engineer working drawings and design calculations for falsework proposed for use at bridges. For bridges where the height of any portion of the falsework, as measured from the ground line to the soffit of the superstructure, exceeds 4.25 m; or where any individual falsework clear span length exceeds 4.85 m; or where provision for vehicular, pedestrian, or railroad traffic through the falsework is made; the drawings shall be signed by an engineer who is registered as a Civil Engineer in the State of California. Six sets of the working drawings and 2 copies of the design calculations shall be furnished. Additional working drawings and design calculations shall be submitted to the Engineer when specified in "Railroad Relations and Insurance" of the special provisions.
- The falsework drawings shall include details of the falsework erection and removal operations showing the methods and sequences of erection and removal and the equipment to be used. The details of the falsework erection and removal operations shall demonstrate the stability of all or any portions of the falsework during all stages of the erection and removal operations.
- Attention is directed to Section 5-1.02, "Plans and Working Drawings."
- For falsework over railroads, approval by the Engineer of the falsework drawings will be contingent upon the drawings being satisfactory to the railroad company involved.
- Except for placement of foundation pads and piles, the construction of any unit of falsework shall not start until the Engineer has reviewed and approved the drawings for that unit.
- Except as otherwise provided in the special provisions, the Contractor shall allow 3 weeks after complete drawings and all support data are submitted, for the review of any falsework plan.
- In the event that several falsework plans are submitted simultaneously, or an additional plan is submitted for review before the review of a previously submitted plan has been completed, the Contractor shall designate the sequence in which the plans are to be reviewed. In such event, the time to be provided for the review of any plan in the sequence shall be not less than the review time specified above for that plan, plus 2 weeks for each plan of higher priority which is still under review. A falsework plan submittal shall consist of plans for a single bridge or portion thereof. For multi-frame bridges, each frame shall require a separate falsework plan submittal.
- Should the Engineer fail to complete the review within the time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in falsework plan review, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays."
- The Contractor may revise approved falsework drawings provided sufficient time is allowed for the Engineer's review and approval before construction is started on the revised portions. The additional time will not be more than that which was originally allowed.
- If structural composite lumber is proposed for use, the falsework drawings shall clearly identify the structural composite lumber members by grade (E value), species, and type. The Contractor shall provide technical data from the manufacturer showing the tabulated working stress values of the composite lumber. The Contractor shall furnish a certificate of compliance as specified in Section 6-1.07, "Certificates of Compliance," for each delivery of structural composite lumber to the project site.
- The falsework drawings shall include a superstructure placing diagram showing the concrete placing sequence and construction joint locations. When a schedule for placing concrete is shown on the contract plans, no deviation will be permitted.
- The maximum length of falsework spans used to support T-beam girder bridges shall not exceed 4.3 m plus 8.5 times the depth of the T-beam girder.
- When footing type foundations are to be used, the Contractor shall determine the bearing value of the soil and shall show the values assumed in the design of the falsework on the falsework drawings.

- When pile type foundations are to be used, the falsework drawings shall show the maximum horizontal distance that the top of a falsework pile may be pulled in order to position the falsework pile under its cap. The falsework plans shall also show the maximum allowed deviation of the top of the pile, in its final position, from a vertical line through the point of fixity of the pile.
- For falsework piles with a calculated loading capacity greater than 900 kN, the falsework piles shall be designed by an engineer who is registered as either a Civil Engineer or a Geotechnical Engineer in the State of California, and the calculations shall be submitted to the Engineer.
- Anticipated total settlements of falsework and forms shall be shown on the falsework drawings. These should include falsework footing settlement and joint take-up. Anticipated settlements shall not exceed 25 mm. Falsework supporting deck slabs and overhangs on girder bridges shall be designed so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.
- Falsework footings shall be designed to carry the load imposed upon the footings without exceeding the estimated soil bearing values and anticipated settlements.
- Foundations for individual steel towers where the maximum leg load exceeds 130 kN shall be designed and constructed to provide uniform settlement under all legs of each tower under all loading conditions.
- The support systems for form panels supporting concrete deck slabs and overhangs on girder bridges shall also be considered to be falsework and designed as such.
- Temporary bracing shall be provided, as necessary, to withstand all imposed loads during erection, construction, and removal of any falsework. The falsework drawings shall show provisions for the temporary bracing, or methods to be used to conform to this requirement during each phase of erection and removal. Wind loads shall be included in the design of the bracing or methods.
- The falsework design calculations shall show the stresses and deflections in load supporting members.
- The design of falsework will not be approved unless it is based on the use of loads and conditions which are no less severe than those described in Section 51-1.06A(1), "Design Loads," and based on the use of stresses and deflections which are no greater than those described in Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections." The Contractor is responsible for the proper evaluation of the falsework materials and design of the falsework to safely carry the actual loads imposed.

Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

51-1.06A(1) Design Loads

- The design load for falsework shall consist of the sum of dead and live vertical loads, and an assumed horizontal load. The minimum total design load for any falsework, including members that support walkways, shall be not less than 4800 N/m² for the combined live and dead load regardless of slab thickness.
- Dead loads shall include the loads due to the mass of concrete, reinforcing steel, forms, and falsework. The loads due to the mass of concrete, reinforcing steel, and forms shall be assumed to be not less than 25 kN/m³ for normal concrete and not less than 20 kN/m³ for lightweight concrete.
- Live loads shall consist of the actual load of any equipment to be supported by falsework applied as concentrated loads at the points of contact, and a uniform load of not less than 960 N/m² applied over the area supported, plus 1100 N/m applied at the outside edge of deck overhangs.
- The assumed horizontal load to be resisted by the falsework bracing system shall be the sum of the actual horizontal loads due to equipment, construction sequence, or other causes, and an allowance for wind, but in no case shall the assumed horizontal load to be resisted in any direction be less than 2 percent of the total dead load. The falsework shall be designed so that it will have sufficient rigidity to resist the assumed horizontal load without considering the load due to the concrete.
- The minimum horizontal load to be allowed for wind on heavy-duty steel shoring or steel pipe column falsework having a vertical load carrying capacity exceeding 130 kN per leg or column shall be the sum of the products of the wind impact area, shape factor, and applicable wind pressure value for each height zone. The wind impact area is the total projected area of all the elements in the tower face or falsework bent normal to the direction of the applied wind. The shape factor shall be taken as 2.2 for heavy-duty shoring and 1.0 for pipe column falsework. Wind pressure values shall be determined from the following table:

| Height Zone (Meters above ground) | Wind Pressure Value (Pa) | |
|---|--|--------------------|
| | Shores or Columns Adjacent to Traffic | At Other Locations |
| 0-9 | 960 | 720 |
| 9-15 | 1200 | 960 |
| 15-30 | 1440 | 1200 |
| over 30 | 1675 | 1440 |

- The minimum horizontal load to be allowed for wind on all other types of falsework, including falsework supported on heavy-duty shoring or pipe column falsework, shall be the sum of the products of the wind impact area and applicable wind pressure value for each height zone. The wind impact area is the gross projected area of the falsework and any unrestrained portion of the permanent structure, excluding the areas between falsework bents or towers where diagonal bracing is not used. Wind pressure values shall be determined from the following table:

| Height Zone (Meters above ground) | Wind Pressure Value (Pa) | |
|--------------------------------------|---|-----------------------|
| | For Members Over and Bents Adjacent to Traffic Opening | At Other Locations |
| 0 to 9 | 2.0 Q | 1.5 Q |
| 9 to 15 | 2.5 Q | 2.0 Q |
| 15 to 30 | 3.0 Q | 2.5 Q |
| Over 30 | 3.5 Q | 3.0 Q |

$Q = 48 + 31.4 W$; but shall not be more than 479 Pa.

W = width of the falsework system, in meters, measured in the direction of the wind force being considered.

- The entire superstructure cross-section, except railing, shall be considered to be placed at one time except as provided herein. Girder stems and connected bottom slabs, if placed more than 5 days prior to the top slab, may be considered to be self supporting between falsework posts at the time the top slab is placed provided that the distance between falsework posts does not exceed 4 times the depth of the portion of the girder placed in the first pour.
- In addition to the minimum requirements specified in this Section 51-1.06A, falsework for box girder structures with internal falsework bracing systems using flexible members capable of withstanding tensile forces only, shall be designed to include the vertical effects caused by the elongation of the flexible member and the design horizontal load combined with the dead and live loads imposed by concrete placement for the girder stems and connected bottom slabs. Falsework comprised of individual steel towers with bracing systems using flexible members capable of withstanding tensile forces only to resist overturning, shall be exempt from these additional requirements.
- If the concrete is to be prestressed, the falsework shall be designed to support any increased or readjusted loads caused by the prestressing forces.

Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

51-1.06A(2) Design Stresses, Loadings, and Deflections

- The maximum allowable design stresses and loadings listed in this Section 51-1.06A(2), are based on the use of undamaged, high-quality materials, and such stresses and loadings shall be reduced by the Contractor if lesser quality materials are to be used.
- The maximum allowable stresses, loadings, and deflections used in the design of the falsework shall be as follows:

Timber:

| | |
|---|---|
| Compression perpendicular to the grain | 3.1 MPa |
| Compression parallel to the grain | $3310 \div (L/d)^2$ MPa; not to exceed 11 MPa |
| Flexural stress | 12.4 MPa; 10.3 MPa for members with a nominal depth of 205 mm or less |
| Horizontal shear | 1.0 MPa |
| Axial tension | 8.3 MPa |
| Deflection due to concrete loading only | 0.0042 of the span, irrespective of deflection compensated for by camber strips |
| Modulus of elasticity (E) | 11×10^3 MPa |
| Timber piles | 400 kN |

L = unsupported length (mm).

d = least dimension of a square or rectangular column, or the width of a square of equivalent cross-sectional area for round columns (mm).

- Timber connections shall be designed in conformance with the procedures, stresses, and loads permitted in the Falsework Manual as published by the Department of Transportation.

Steel:

- For identified grades of steel, design stresses, except stresses due to flexural compression, shall not exceed those specified in the Manual of Steel Construction as published by the AISC.
- When the grade of steel cannot be positively identified, design stresses, except stresses due to flexural compression, shall not exceed either those specified in the AISC Manual for ASTM Designation: A 36/A 36M steel or the following:

| | |
|--|---|
| Tension, axial and flexural | 152 MPa |
| Compression, axial | $110\ 300 - 2.62(L/r)^2$ kPa; except L/r shall not exceed 120 |
| Shear on gross section of web of rolled shapes | 100 MPa |
| Web crippling for rolled shapes | 186 MPa |

- For all grades of steel, design stresses and deflections shall not exceed the following:

| | |
|---|--|
| Compression, flexural | $83\ 000 \div Ld/bt$ MPa, but not to exceed 152 MPa for unidentified steel or steel conforming to the requirements in ASTM Designation: A 36/A 36M nor $0.6F_y$ for other identified steel |
| Deflection due to concrete loading only | 0.0042 of the span, irrespective of deflection compensated for by camber strips |

- In the foregoing formulas, L is the unsupported length; d is the least dimension of rectangular columns, or the width of a square of equivalent cross-sectional area for round columns, or the depth of beams; b is the width and t is the thickness of the compression flange; and r is the radius of gyration of the member. All dimensions are expressed in millimeters. F_y is the specified minimum yield stress, in MPa, for the grade of steel used.
- The modulus of elasticity (E) used for steel shall be 20.7×10^4 MPa.

Manufactured Assemblies:

- The maximum loadings and deflections used on jacks, brackets, columns, joists, and other manufactured devices shall not exceed the manufacturer's recommendations except that the dead load deflection of the joists used at locations other than under deck slabs between girders shall not exceed 0.0042 of their spans. If requested by the Engineer, the Contractor shall furnish engineering data from the manufacturer verifying the manufacturer's recommendations, or shall perform tests as necessary to demonstrate the adequacy of the devices proposed for use.

Welding and Nondestructive Testing

Welding of steel members, except for when fillet welds are used where load demands are less than or equal to 175 N/mm for each 3 mm of fillet weld, shall conform to AWS D1.1 or other recognized welding standard. The welding standard to be utilized shall be specified by the Contractor on the working drawings.

Splices made by field welding of steel beams at the project site shall undergo nondestructive testing (NDT). At the option of the Contractor, either ultrasonic testing (UT) or radiographic testing (RT) shall be used as the method of NDT for each field weld and any repair made to a previously welded splice in a steel beam. Testing shall be performed at locations selected by the Contractor. The length of a splice weld where NDT is to be performed, shall be a cumulative weld length equal to 25 percent of the original splice weld length. The cover pass shall be ground smooth at the locations to be tested. The acceptance criteria shall conform to the requirements of AWS D1.1, Section 6, for cyclically loaded nontubular connections subject to tensile stress. If repairs are required in a portion of the weld, additional NDT shall be performed on the repaired sections. The NDT method chosen shall be used for an entire splice evaluation including any required repairs.

For all field welded splices and previously welded splices, the Contractor shall furnish to the Engineer a letter of certification which certifies that all welding and NDT, including visual inspection, are in conformance with the specifications and the welding standard shown on the approved working drawings. The letter of certification shall be signed by an engineer who is registered as a Civil Engineer in the State of California and shall be provided prior to placing any concrete for which the falsework is being erected to support.

Section 51-1.06A(3), "Special Locations," of the Standard Specifications is amended to read:

51-1.06A(3) Special Locations

- In addition to the minimum requirements specified in this Section 51-1.06A, falsework over or adjacent to roadways or railroads which are open to traffic shall be designed and constructed so that the falsework will be stable if subjected to impact by vehicles. Falsework posts which support members that cross over a roadway or railroad shall be considered as adjacent to roadways or railroads. Other falsework posts shall be considered as adjacent to roadways or railroads only if they are located in the row of falsework posts nearest to the roadway or railroad, and the horizontal distance from the traffic side of the falsework to the edge of pavement, or to a point 3 m from the centerline of track, is less than the total height of the falsework and forms. The Contractor shall provide any additional features for the work needed to ensure that falsework will be stable if subjected to impact by vehicles and to comply with the provisions in Section 7-1.09, "Public Safety." The falsework design at these locations shall include, but not be limited to, the following minimum provisions:

The vertical load used for the design of falsework posts and towers, but not footings, which support the portion of the falsework over openings, shall be the greater of the following:

- (1) 150 percent of the design load calculated in conformance with the provisions for design load previously specified but not including any increased or readjusted loads caused by the prestressing forces, or
- (2) the increased or readjusted loads caused by the prestressing forces.

Falsework posts adjacent to roadways or railroads shall consist of either steel with a minimum section modulus about each axis of $156 \times 10^3 \text{ mm}^3$, or sound timbers with a minimum section modulus about each axis of $4.1 \times 10^6 \text{ mm}^3$.

Each falsework post adjacent to roadways or railroads shall be mechanically connected to its supporting footing at its base, or otherwise laterally restrained, so as to withstand a force of not less than 9 kN applied at the base of the post in any direction except toward the roadway or railroad track. The posts also shall be mechanically connected to the falsework cap or stringer. The mechanical connection shall be capable of resisting a load in any horizontal direction of not less than 4.5 kN.

For falsework spans over roadways, all exterior falsework stringers, and stringers adjacent to the ends of discontinuous caps, the stringer or stringers over points of minimum vertical clearance and every fifth remaining stringer, shall be mechanically connected to the falsework cap or framing. The mechanical connections shall be capable of resisting a load in any direction, including uplift on the stringer, of not less than 2.2 kN. The connections shall be installed before traffic is allowed to pass beneath the span. For falsework spans over railroads, all falsework stringers shall be so connected to caps.

When timber members are used to brace falsework bents which are located adjacent to roadways or railroads, all connections for the timber bracing shall be of the bolted type using 16-mm diameter or larger bolts.

The falsework shall be located so that falsework footings or piles are at least 75 mm clear of railing posts and barriers, and all other falsework members are at least 0.3-m clear of railing members and barriers.

Falsework bents within 6 m of the center line of a railroad track shall be sheathed solid in the area between 1 m and 5 m above the track elevation on the side facing the track. Sheathing shall consist of plywood not less than 16-mm thick or lumber not less than 19-mm thick. Bracing on these bents shall be adequate so that the bent will resist the required assumed horizontal load or 22 kN, whichever is greater.

The dimensions of the clear openings to be provided through falsework for roadways shall be as specified in "Maintaining Traffic," of the special provisions.

The dimensions of clear openings to be provided through the falsework for railroads shall be as specified in "Railroad Relations and Insurance," of the special provisions.

Section 51-1.06B, "Falsework Construction," of the Standard Specifications is amended to read:

51-1.06B Falsework Construction

- The falsework shall be constructed to substantially conform to the falsework drawings. The materials used in the falsework construction shall be of the quality necessary to sustain the stresses required by the falsework design. When manufactured assemblies are used in falsework, the Contractor shall furnish to the Engineer a letter of certification which certifies that all components of these manufactured assemblies are used in conformance with the manufacturer's recommendations. The workmanship used in falsework construction shall be of such quality that the falsework will support the loads imposed on the falsework without excessive settlement or take-up beyond that shown on the falsework drawings.
- Falsework shall be founded on a solid footing safe against undermining, protected from softening, and capable of supporting the loads imposed on the falsework. When requested by the Engineer, the Contractor shall demonstrate by suitable load tests that the soil bearing values assumed for the design of the falsework do not exceed the supporting capacity of the soil.
- When falsework is supported on piles, the piles shall be driven and the actual bearing value assessed in conformance with the provisions in Section 49, "Piling."
- For falsework piles with a calculated loading capacity greater than 900 kN, the Contractor shall conduct dynamic monitoring of pile driving and conduct penetration and bearing analyses based on a wave equation analysis. These analyses shall be signed by an engineer who is registered as a Civil Engineer in the State of California and submitted to the Engineer prior to completion of falsework erection.
- When falsework is over or adjacent to roadways or railroads, all details of the falsework system which contribute to horizontal stability and resistance to impact, except for bolts in bracing, shall be installed at the time each element of the falsework is erected and shall remain in place until the falsework is removed.
- Prior to the placement of falsework members above the stringers, the final bracing system for the falsework shall be installed.
- Temporary railing (Type K), conforming to the provisions in Section 12-3, "Traffic-Handling Equipment and Devices," shall be installed on both sides of all vehicular openings through falsework and, when ordered by the Engineer, at all other falsework less than 3.6 m from the edge of a traffic lane. Temporary railings shall begin approximately 46 m in advance of the falsework and shall extend past the falsework, in the direction of adjacent traffic flow. For 2-way traffic openings, the temporary railing shall extend at least 18 m past the falsework, in the direction of adjacent traffic flow. The location and length of railing and the type of flare to be used shall be as ordered by the Engineer. The clear vehicular opening between temporary railings shall be not less than that specified in the special provisions.
- The installation of temporary railing shall be complete before falsework erection is begun. Temporary railing at falsework shall not be removed until the removal is approved by the Engineer.
- Temporary railing (Type K) installed as specified above will be measured and paid for as provided in Section 12-4, "Measurement and Payment," except that when the Engineer's Estimate does not include a contract item for temporary railing (Type K), full compensation for furnishing, placing, maintaining, repairing, replacing, and removing the temporary railing at falsework locations as specified in this Section 51-1.06B, shall be considered as included in the contract prices paid for the various items of work requiring falsework, and no separate payment will be made therefor.
- Camber strips shall be used where directed by the Engineer to compensate for falsework deflection, vertical alignment, and anticipated structure deflection. The Engineer will furnish to the Contractor the amount of camber to be used in constructing the falsework.
- The Contractor shall provide tell-tales attached to the soffit forms and readable from the ground in enough systematically placed locations to determine the total settlement of the entire portion of the structure where concrete is being placed.

- Deck slab forms between girders shall be constructed with no allowance for settlement relative to the girders.
- Dead loads, other than those due to forms and reinforcing steel, shall not be applied to any falsework until authorized by the Engineer.
- Should unanticipated events occur, including settlements that deviate by more than ± 10 mm from those indicated on the falsework drawings, which in the opinion of the Engineer would prevent obtaining a structure conforming to the requirements of these specifications, the placing of concrete shall be discontinued until corrective measures satisfactory to the Engineer are provided. In the event satisfactory measures are not provided prior to initial set of the concrete in the affected area, the placing of concrete shall be discontinued at a location determined by the Engineer. All unacceptable concrete shall be removed.

Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended to read:

51-1.06C Removing Falsework

- Falsework supporting any span of a simple span bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed. Unless otherwise permitted by the Engineer, falsework supporting any span of a continuous or rigid frame bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed in that span and in the adjacent portions of each adjoining span for a length equal to at least one-half the length of the span where falsework is to be released.
- Falsework for cast-in-place prestressed portions of structures shall not be released until after the prestressing steel has been tensioned.
- Falsework supporting any span of a continuous or rigid frame bridge shall not be removed until all required prestressing has been completed in that span and in the adjacent portions of each adjoining span for a length equal to at least one-half the length of the span where falsework is to be released.
- Falsework for arch bridges shall be removed uniformly and gradually, beginning at the crown and working toward the springing, to permit the arch to take its load slowly and evenly. Falsework for adjacent arch spans shall be struck simultaneously.
- Falsework supporting overhangs, deck slabs between girders, and girder stems which slope 45 degrees or more off vertical shall not be released before 7 days after the deck concrete has been placed.
- Falsework supporting the sides of the girder stems which slope less than 45 degrees off vertical may be removed prior to placing deck slab concrete, providing a reshoring system is installed. The reshoring system shall consist of lateral supports which are designed to resist all rotational forces acting on the stem, including those caused by the placement of deck slab concrete. The lateral supports shall be installed immediately after each form panel is removed and prior to the release of supports for the adjacent form panel.
- Falsework for bent caps which will support steel or precast concrete girders shall not be released before 7 days after the cap concrete has been placed. Girders shall not be erected onto the bent caps until the concrete in the cap has attained a compressive strength of 18 MPa or 80 percent of the specified strength, whichever is higher.
- Unless otherwise specified, removing falsework supporting any span of structural members subject to bending, shall conform to the requirements for removing falsework supporting any span of a simple span bridge.
- In addition to the above requirements, no falsework for bridge spans shall be released until the supported concrete has attained a compressive strength of 18 MPa or 80 percent of the specified strength, whichever is higher.
- Falsework for box culverts and other structures with decks lower than the roadway pavement and with span lengths of 4.25 m or less shall not be released until the last placed concrete has attained a compressive strength of 11 MPa, provided that curing of the concrete is not interrupted. Falsework removal for other box culverts shall conform to the requirements for release of bridge falsework.
- Falsework for arch culverts shall not be released before 40 hours after the supported concrete has been placed.
- The falsework removal operation shall be conducted in such a manner that any portion of the falsework not yet removed remains in a stable condition at all times.
- All falsework materials shall be completely removed. Falsework piling shall be removed at least 0.6-m below the surface of the original ground or original streambed. When falsework piling is driven within the limits of ditch or channel excavation areas, the falsework piling within those areas shall be removed to at least 0.6-m below the bottom and side slopes of the excavated areas.
- All debris and refuse resulting from the work shall be removed and the premises left in a neat and presentable condition.

COST REDUCTION INCENTIVE PROPOSALS FOR CAST-IN-PLACE PRESTRESSED BOX GIRDER BRIDGES

Except as provided herein, cast-in-place prestressed box girder bridges shall be constructed in conformance with the details shown on the plans and the provisions in Section 50, "Prestressing Concrete," and Section 51, "Concrete Structures," of the Standard Specifications.

If the Contractor submits cost reduction incentive proposals for cast-in-place prestressed box girder bridges, the proposals shall be in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications and these special provisions.

The Engineer may reject any proposal which, in the Engineer's judgment, may not produce a structure which is at least equivalent to the planned structure.

At the time the cost reduction incentive proposal (CRIP) is submitted to the Engineer, the Contractor shall also submit 4 sets of the proposed revisions to the contract plans, design calculations, and calculations from an independent checker for all changes involved in the proposal, including revisions in camber, predicted deck profile at each construction stage, and falsework requirements to the Office of Structure Design, Documents Unit, P.O. Box 942874, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), telephone (916) 227-8230. When notified in writing by the Engineer, the Contractor shall submit 12 sets of the CRIP plan revisions and calculations to the Office of Structure Design for final approval and use during construction. The calculations shall verify that all requirements are satisfied. The CRIP plans and calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California.

The CRIP plans shall be either 279 mm x 432 mm, or 559 mm x 864 mm in size. Each CRIP plan sheet and calculation sheet shall include the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Kilometer Post. Each CRIP plan sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

Within 3 weeks after final approval of the CRIP plan sheets, one set of the corrected good quality prints on 75-g/m² (minimum) bond paper, 559 mm x 864 mm in size, of all CRIP plan sheets prepared by the Contractor for each CRIP shall be furnished to the Office of Structure Design, Documents Unit.

Each CRIP shall be submitted prior to completion of 25 percent of the contract working days and sufficiently in advance of the start of the work that is proposed to be revised by the CRIP to allow time for review by the Engineer and correction by the Contractor of the CRIP plans and calculations without delaying the work. The Contractor shall allow a minimum of 8 weeks for the review of a CRIP. In the event that several CRIPs are submitted simultaneously, or an additional CRIP is submitted for review before the review of a previously submitted CRIP has been completed, the Contractor shall designate the sequence in which the CRIPs are to be reviewed. In this event, the time to be provided for the review of any proposal in the sequence shall be not less than the review time specified herein for that proposal, plus 2 weeks for each CRIP of higher priority which is still under review.

Should the review not be complete by the date specified in the Contractor's CRIP, or such other date as the Engineer and Contractor may subsequently have agreed to in writing and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in review of CRIP plans and calculations, an extension of time commensurate with the delay in completion of the work thus caused will be granted as provided in Section 8-1.07, "Liquidated Damages," of the Standard Specifications except that the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications shall not apply.

Permits and approvals required of the State have been obtained for the structures shown on the plans. Proposals which result in a deviation in configuration may require new permits or approvals. The Contractor shall be responsible for obtaining the new permits and approvals before the Engineer will reach a decision on the proposal. Delays in obtaining permits and approvals will not be reason for granting an extension of contract time.

All proposed modifications shall be designed in conformance with the bridge design specifications and procedures currently employed by the Department. The proposal shall include all related, dependent or incidental changes to the structure and other work affected by the proposal. The proposal will be considered only when all aspects of the design changes are included for the entire structure. Changes, such as but not limited to, additional reinforcement and changes in location of reinforcement, necessary to implement the CRIP after approval by the Engineer, shall be made at the Contractor's expense.

Modifications may be proposed in (1) the thickness of girder stems and deck slabs, (2) the number of girders, (3) the deck overhang dimensions as specified herein, (4) the amount and location of reinforcing steel, (5) the amount and location of prestressing force in the superstructure, and (6) the number of hinges, except that the number of hinges shall not be increased. The strength of the concrete used may be increased but the strength employed for design or analysis shall not exceed 42 MPa.

Modifications proposed to the minimum amount of prestressing force which must be provided by full length draped tendons are subject to the provisions in "Prestressing Concrete" of these special provisions.

No modifications will be permitted in (1) the foundation type, (2) the span lengths or (3) the exterior dimensions of columns or bridge superstructure, except that the overhang dimension from face of exterior girder to the outside edge of roadway deck may be uniformly increased or decreased by 25 percent on each side of the box girder section. Fixed connections at the tops and bottoms of columns shown on the plans shall not be eliminated.

The Contractor shall be responsible for determining construction camber and obtaining the final profile grade as shown on the plans.

The Contractor shall reimburse the State for the actual cost of investigating CRIPs for cast-in-place prestressed box girder bridges submitted by the Contractor. The Department will deduct this cost from any moneys due, or that may become due the Contractor under the contract, regardless of whether or not the proposal is approved or rejected.

SLIDING BEARINGS

Sliding bearings consisting of elastomeric bearing pads lubricated with grease and covered with sheet metal shall conform to the following requirements:

- A. Grease shall conform to the requirements of Military Specification: MIL-S-8660. A uniform film of grease shall be applied to the upper surface of the pads prior to placing the sheet metal.
- B. Sheet metal shall be commercial quality galvanized sheet steel. The sheet metal shall be smooth and free of kinks, bends, or burrs.
- C. Construction methods and procedures shall prevent grout or concrete seepage into the sliding bearing assembly.

ELASTOMERIC BEARING PADS

Elastomeric bearing pads shall conform to the provisions in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications and these special provisions.

The table in the ninth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearing Pads," of the Standard Specifications is amended to read:

| | |
|------------------------------|--|
| Tensile strength, percent | -15 |
| Elongation at break, percent | -40; but not less than 300% total elongation of the material |
| Hardness, points | +10 |

10-1.40 SEALING JOINTS

Joints in concrete bridge decks and joints between concrete structures and concrete approach slabs shall be sealed in conformance with the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

Where polyurethane seals are shown on the plans, a silicone sealant conforming to the provisions in Section 51-1.12F, "Sealed Joints," of the Standard Specifications may be used.

When ordered by the Engineer, a joint seal larger than called for by the Movement Rating shown on the plans shall be furnished and installed. Payment to the Contractor for furnishing the larger seal and for saw cutting the increment of additional depth of groove required will be determined as provided in Section 4-1.03, "Changes," of the Standard Specifications.

10-1.41 ARCHITECTURAL SURFACE (TEXTURED CONCRETE)

Architectural texture for concrete surfaces shall conform to the details shown on the plans and the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

Architectural textures listed below are required at concrete surfaces shown on the plans:

- A. Cobblestone texture

COBBLESTONE TEXTURE

Cobblestone texture shall be an architectural treatment simulating the appearance of cobblestone and shall conform to the sample pattern.

The cobblestone pattern shall be arranged such that no partial cobbles exist at the edge of the form liner panel.

REFEREE SAMPLE

The architectural texture shall match the texture, color and pattern of the referee sample located at 2829 Juan Street, San Diego, California.

TEST PANEL

A test panel at least 1.25 m x 1.25 m in size shall be successfully completed at a location approved by the Engineer before beginning work on architectural textures. The test panel shall be constructed and finished with the materials, tools, equipment and methods to be used in constructing the architectural texture. If ordered by the Engineer, additional test panels shall be constructed and finished until the specified finish, texture and color are obtained, as determined by the Engineer.

The test panel approved by the Engineer shall be used as the standard of comparison in determining acceptability of architectural texture for concrete surfaces.

FORM LINERS

Form liners shall be used for textured concrete surfaces and shall be installed in conformance with the manufacturer's recommendations, unless other methods of forming textured concrete surfaces are approved by the Engineer. Form liners shall be manufactured from an elastomeric material or a semi-elastomeric polyurethane material by a manufacturer of commercially available concrete form liners. No substitution of other types of formliner material will be allowed. Form liners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of form liner patterns. Textured concrete surfaces with such recurring textural configurations shall be reworked to remove such patterns as approved by the Engineer or the concrete shall be replaced.

Form liners shall have the following properties:

| Description | ASTM Designation: | Range |
|-------------------------------|-------------------|------------|
| Elastomeric material | | |
| Shore A hardness | D 2240 | 20 to 65 |
| Tensile strength (MPa) | D 412 | 0.9 to 6.2 |
| Semi-elastomeric polyurethane | | |
| Shore D hardness | D 2240 | 55 to 65 |
| Tensile strength (MPa) | D 2370 | 18 minimum |

Cuts and tears in form liners shall be sealed and repaired in conformance with the manufacturer's recommendations. Form liners that are delaminated from the form shall not be used. Form liners with deformations to the manufactured surface caused by improper storage practices or any other reason shall not be used.

Form liners shall extend the full length of texturing with transverse joints at 2.5 m minimum spacing. Small pieces of form liners shall not be used. Grooves shall be aligned straight and true. Grooves shall match at joints between form liners. Joints in the direction of grooves in grooved patterns shall be located only in the depressed portion of the textured concrete. Adjoining liners shall be butted together without distortion, open cracks or offsets at the joints. Joints between liners shall be cleaned before each use to remove any mortar in the joint.

Adhesives shall be compatible with the form liner material and with concrete. Adhesives shall be approved by the liner manufacturer. Adhesives shall not cause swelling of the liner material.

RELEASING FORM LINERS

Products and application procedures for form release agents shall be approved by the form liner manufacturer. Release agents shall not cause swelling of the liner material or delamination from the forms. Release agents shall not stain the concrete or react with the liner material. For reliefs simulating fractured concrete or wood grain surfaces the application method shall include the scrubbing method using a natural bristle scrub brush in the direction of grooves or grain. The release agent shall coat the liner with a thin film. Following application of form release agent, the liner surfaces shall be cleaned of excess amounts of agent using compressed air. Buildup of form release agent caused by the reuse of a liner shall be removed at least every 5 uses.

Form liners shall release without leaving particles or pieces of liner material on the concrete and without pulling or breaking concrete from the textured surface. The concrete surfaces exposed by removing forms shall be protected from damage.

ABRASIVE BLASTING

The architectural texture shall be abrasive blasted with fine abrasive to remove the sheen without exposing coarse aggregate.

CURING

Concrete surfaces with architectural texture shall be cured only by the forms-in-place or water methods. Seals and curing compounds shall not be used.

MEASUREMENT AND PAYMENT

Architectural texture will be measured and paid for by the square meter.

The contract price paid per square meter for architectural texture shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in architectural texture, complete in place, including test panels, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.42 REINFORCEMENT

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

The third paragraph of Section 52-1.04, "Inspection," of the Standard Specifications is amended to read:

- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall also be furnished for each shipment of epoxy-coated bar reinforcement or wire reinforcement certifying that the coated reinforcement conforms to the requirements in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include all of the certifications specified in ASTM Designation: A 775/A 775M or A 884/A 884M respectively, and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

The third paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The total slip of the reinforcing bars within the splice sleeve after loading in tension to 200 MPa and relaxing to 20 MPa shall not exceed the values listed in the following table. The slip shall be measured between gage points that are clear of the splice sleeve.

| Reinforcing Bar Number | Total Slip (µm) |
|------------------------|-----------------|
| 13 | 250 |
| 16 | 250 |
| 19 | 250 |
| 22 | 350 |
| 25 | 350 |
| 29 | 350 |
| 32 | 450 |
| 36 | 450 |
| 43 | 600 |
| 57 | 750 |

The first paragraph of Section 52-1.08C(5), "Sleeve-Lockshear Bolt Mechanical Butt Splices," of the Standard Specifications is amended to read:

- The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, center hole with centering pin, and bolts that are tightened until the bolt heads shear off with the bolt ends left embedded in the reinforcing bars. The seamless steel sleeve shall be either formed into a V configuration or shall have 2 serrated steel strips welded to the inside of the sleeve.

Section 52-1.08F, "Nondestructive Splice Tests," of the Standard Specifications is amended by deleting the seventh paragraph.

Individual hoops, made continuous with butt welded splices, which are substituted for spiral reinforcement, shall conform to the requirements for "Ultimate Butt Splices" of these special provisions.

ULTIMATE BUTT SPLICES

Ultimate butt splices shall be either welded or mechanical splices, shall be used at the locations shown on the plans, and shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

GENERAL REQUIREMENTS

The Contractor shall designate in writing an ultimate butt splicing Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for 1) the quality of all ultimate butt splicing including the inspection of materials and workmanship performed by the Contractor and all subcontractors; and 2) submitting, receiving, and approving all correspondence, required submittals, and reports regarding ultimate butt splicing to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

The length of any type of ultimate mechanical butt splice shall not exceed 10 times the bar diameter of the larger bar to be spliced.

All ultimate prejob, production, and job control sample splices shall be 1) a minimum length of 1.5 meters for reinforcing bars No. 25 or smaller and 2 meters for reinforcing bars No. 29 or larger, with the splice located at mid-point, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. Any splice that shows signs of tampering will be rejected.

A minimum of one control bar shall be removed from the same bar as, and adjacent to, all ultimate prejob, production, and job control sample splices. Control bars shall be 1) a minimum length of one meter for reinforcing bars No. 25 or smaller and 1.5 meters for reinforcing bars No. 29 or larger, and 2) suitably identified prior to shipment with weatherproof markings that do not interfere with the Engineer's tamper-proof markings or seals. The portion of adjacent bar remaining in the work shall also be identified with weatherproof markings that correspond to its adjacent control bar.

Shorter length sample splice and control bars may be furnished if approved in writing by the Engineer.

Each sample splice and its associated control bar shall be identified and marked as a set. Each set shall be identified as representing a prejob, production, or job control sample splice.

The portion of hoop reinforcing bar, removed to obtain a sample splice and control bar, shall be replaced using a prequalified ultimate mechanical butt splice, or the hoop shall be replaced in kind.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications shall not apply.

The independent qualified testing laboratory used to perform the testing of all ultimate butt sample splices and control bars shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors who will provide other services or materials for the project, and shall have the following:

- A. Proper facilities, including a tensile testing machine capable of breaking the largest size of reinforcing bar to be tested.
- B. A device for measuring the total slip of the reinforcing bars across the splice to the nearest 25 μm , that, when placed parallel to the longitudinal axis of the bar is able to simultaneously measure movement across the splice, at 2 locations, 180 degrees apart.
- C. Operators who have received formal training for performing the testing requirements of ASTM Designation: A 370/A 370M and California Test 670.
- D. A record of annual calibration of testing equipment performed by an independent third party that has 1) standards that are traceable to the National Institute of Standards and Technology, and 2) a formal reporting procedure, including published test forms.

ULTIMATE BUTT SPLICE TEST CRITERIA

Ultimate prejob, production, and job control sample splices shall be tensile tested in conformance with the requirements described in ASTM Designation: A 370/A 370M and California Test 670.

Ultimate prejob and production sample splices shall rupture in the reinforcing bar either: 1) outside of the affected zone or 2) within the affected zone, provided that the sample has achieved at least 95 percent of the ultimate tensile strength of the control bar associated with the sample. In addition, necking of the bar shall be visibly evident at rupture regardless of whether the bar breaks inside or outside the affected zone.

The affected zone is the portion of the reinforcing bar where any properties of the bar, including the physical, metallurgical, or material characteristics, have been altered by fabrication or installation of the splice.

The ultimate tensile strength of each control bar shall be determined by tensile testing the bar to rupture and shall be determined for all control bars, regardless of where each sample splice ruptures. If 2 control bars are tested for one sample splice, the bar with the lower ultimate tensile strength shall be considered the control bar.

Testing to determine the minimum tensile strength, in conformance with the provisions in the ninth paragraph of Section 52-1.08, "Splicing," of the Standard Specifications, will not be required.

PREJOB TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES

Prior to use in the work, all ultimate butt splices shall conform to the following prejob test requirements:

- A. Eight prejob sample splices for each bar size of each splice type including ultimate mechanical butt splices, ultimate complete joint penetration butt welded splices, and ultimate resistance butt welded splices, that will be used in the work, shall be fabricated by the Contractor. For deformation-dependent types of couplers, 8 sample prejob splices shall also be fabricated for each reinforcing bar size and deformation pattern that will be used in the work.
- B. The sample splices shall be fabricated using the same splice materials, position, operators, location, and equipment, and following the same procedures as will be used to make the splices in the work.
- C. At the option of the Contractor, operator qualification tests may be performed simultaneously with the preparation of prejob sample splices.
- D. If different diameters of hoops are shown on the plans, prejob sample splices, as described above, will only be required for the smallest hoop diameter. In addition, these splices shall be fabricated using the same radius as shown on the plans for these hoops.
- E. Unless otherwise directed in writing by the Engineer, 4 prejob sample splices and control bar sets shall be shipped to the Transportation Laboratory and the remaining 4 sets shall be tested by the Contractor's independent qualified testing laboratory.
- F. Each group of 4 sets from a prejob test shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested by the Transportation Laboratory, nor shall they be tested by the independent laboratory.
- G. All 8 sample splices from each prejob test shall conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein.
- H. Prior to performing any tensile tests on prejob test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. All 3 of these remaining samples tested shall conform to the aforementioned slip requirements.
- I. For each bundle of 4 sets, a Prejob Test Report shall be prepared by the independent testing laboratory performing the testing. The report shall 1) be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California; 2) include, as a minimum, the following information for each set: contract number, bridge number, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of affected zone, total measured slip, location of visible necking area,

ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice; and 3) be submitted to the QCM for review and approval, and then to the Engineer.

- J. Test results for each bundle of 4 sets will be reported in writing to the Contractor within 10 working days after receipt of the bundle by the Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received.
- K. Should the Engineer fail to provide the test results within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in providing the test results, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

PRODUCTION TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES

Production tests shall be performed for all ultimate butt splices used in the work. A production test shall consist of 4 sets of sample splices and control bars removed from each lot of completed splices, except when quality assurance tests are performed.

A lot of ultimate butt splices is defined as 1) 150, or fraction thereof, of the same type of ultimate mechanical butt splices used for each bar size and each bar deformation pattern that is used in the work or 2) 150, or fraction thereof, of ultimate complete joint penetration butt welded splices, or ultimate resistance butt welded splices for each bar size used in the work. If different diameters of hoop reinforcement are shown on the plans, separate lots shall be used for each different hoop diameter.

After all splices in a lot have been completed, the QCM shall notify the Engineer in writing that all couplers in this lot conform to the specifications and are ready for testing. The sample splices will either be selected by the Engineer at the job site or a fabrication facility, provided the facility is located within an 80-km radius of the jobsite.

After notification has been received, the Engineer will randomly select the 4 sample splices to be removed from the lot and place tamper-proof markings or seals on them. The Contractor or QCM shall select the adjacent control bar for each sample splice bar, and the Engineer will place tamper-proof markings or seals on them. These ultimate production sample splices and control bars shall be removed by the Contractor, and tested by an independent qualified testing laboratory, in the presence of either the Engineer or the Engineer's authorized representative.

The Engineer or the Engineer's authorized representative will be at the independent qualified testing laboratory within a maximum of 5 working days after receiving written notification that the samples are at the laboratory and ready for testing. Should the Engineer or the Engineer's authorized representative fail to be at the laboratory within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

A sample splice or control bar from any set will be rejected if any tamper-proof marking or seal is disturbed prior to testing.

The 4 sets from each production test shall be securely bundled together and identified with a completed sample identification card prior to shipment to the independent laboratory. The card will be furnished by the Engineer. Bundles of samples containing fewer than 4 sets of splices shall not be tested.

A Production Test Report for all testing performed on each lot shall be prepared by the independent testing laboratory performing the testing and submitted to the QCM for review and approval. The report shall be signed by an engineer who represents the laboratory and is registered as a Civil Engineer in the State of California. The report shall include, as a minimum, the following information for each set: contract number, bridge number, lot number and location, bar size, type of splice, length of mechanical splice, physical condition of test sample splice and control bar, any notable defects, limits of affected zone, total measured slip, location of visible necking area, ultimate strength of each splice, ultimate strength and 95 percent of this ultimate strength for each control bar, and a comparison between 95 percent of the ultimate strength of each control bar and the ultimate strength of its associated splice.

The QCM must review, approve, and forward each Production Test Report to the Engineer for review before any splices represented by the report are encased in concrete. The Engineer shall have 3 working days to review each Production Test Report and respond in writing after a complete report has been received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Prior to performing any tensile tests on production test sample splices, one of the 4 samples shall be tested for, and shall conform to, the provisions for total slip. Should this sample not meet these requirements, one retest, in which the 3 remaining samples are tested for total slip, will be allowed. Should any of the 3 remaining samples not conform to these requirements, all splices in the lot represented by this production test will be rejected.

If 3 or more sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be considered acceptable.

Should only 2 sample splices from any production test conform to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, one additional production test shall be performed on the same lot of splices. If all 4 sample splices from this additional test do not conform to these provisions, all splices in the lot represented by these production tests will be rejected.

If only one sample splice from any production test conforms to the provisions in "Ultimate Butt Splice Test Criteria" specified herein, all splices in the lot represented by this production test will be rejected.

If a production test for any lot fails, the Contractor will be required to repair or replace all reinforcing bars from which sample splices were removed, complete in place, before the Engineer selects any additional splices from this lot for further testing.

Whenever any lot of ultimate butt splices is rejected, additional ultimate butt splices shall not be used in the work until 1) the QCM performs a complete review of the Contractor's quality control process for these splices, 2) a written report is submitted to the Engineer describing the cause of failure for the splices in this lot and provisions for correcting these failures in future lots, and 3) the Engineer has provided the Contractor with written notification that the report is acceptable. The Engineer shall have 3 working days after receipt of the report to provide notification to the Contractor. Should the Engineer not provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of this action, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Production tests will not be required on any repaired splice from a lot, regardless of the type of prequalified ultimate mechanical butt splice used to make the repair.

Should an additional production test be required, the Engineer may select any repaired splice for use in the additional production test.

QUALITY ASSURANCE TEST REQUIREMENTS FOR ULTIMATE BUTT SPLICES

For the first production test performed, and for at least one, randomly selected by the Engineer, of every 5 additional production tests, or portion thereof, performed thereafter, the Contractor shall concurrently prepare 4 additional ultimate job control sample splices along with associated control bars. These ultimate job control samples shall be prepared in the same manner as specified herein for ultimate prejob sample splices and control bars.

Each time 4 additional ultimate job control sample splices are prepared, 2 of these job control sample splice and associated control bar sets and 2 of the production sample splice and associated control bar sets, together, shall conform to the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

The 2 remaining job control sample splice and associated control bar sets, along with the 2 remaining production sample splice and associated control bar sets shall be shipped, unless otherwise directed in writing by the Engineer, to the Transportation Laboratory for quality assurance testing. The 4 sets shall be securely bundled together and identified by location and contract number with weatherproof markings prior to shipment. Bundles containing fewer than 4 sets will not be tested.

Quality assurance testing will be performed in conformance with the requirements for ultimate production sample splices in "Production Test Requirements for Ultimate Butt Splices" specified herein.

Test results for each bundle of 4 sets will be reported in writing to the Contractor within 3 working days after receipt of the bundle by Transportation Laboratory. In the event that more than one bundle is received on the same day, 2 additional working days shall be allowed for providing test results for each additional bundle received. A test report will be made for each bundle received. Should the Contractor elect to encase any splices prior to receiving notification from the Engineer, it is expressly understood that the Contractor will not be relieved of the Contractor's responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase any splices pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Measurement and payment for reinforcement in structures shall conform to the provisions in Section 52-1.10, "Measurement," and Section 52-1.11, "Payment," of the Standard Specifications and these special provisions.

Epoxy-coated reinforcement will be measured and paid for as bar reinforcing steel (bridge).

10-1.43 SHOTCRETE

Shotcrete shall conform to the provisions in Section 53, "Shotcrete," of the Standard Specifications.

10-1.44 ROADSIDE SIGNS

Roadside signs shall be installed at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in Section 56-2, "Roadside Signs," of the Standard Specifications and these special provisions.

Wood posts shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications with creosote, creosote coal tar solution, creosote petroleum solution (50-50), pentachlorophenol in hydrocarbon solvent, copper naphthenate, ammoniacal copper arsenate, or ammoniacal copper zinc arsenate. In addition to the preservatives listed above, Southern yellow pine may also be pressure treated with chromated copper arsenate. When other than one of the creosote processes is used, blocks shall have a minimum retention of 6.4 kg/m^3 , and need not be incised.

Install sign panel on fence will be measured and paid for as install sign (strap and saddle bracket method).

10-1.45 PLASTIC PIPE

Plastic pipe shall conform to the provisions in Section 64, "Plastic Pipe," of the Standard Specifications and these special provisions.

Plastic pipe shall be Type S.

10-1.46 REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications and these special provisions.

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using Method 1 backfill in trench, as shown on Standard Plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be required unless the minimum distance between the top of the pipe and the pavement surface is the greater of 1.2 m or one half of the outside diameter of the pipe.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

When reinforced concrete pipe is installed in conformance with the details shown on Revised Standard Plan A62DA, the fifth paragraph of Section 19-3.04, "Water Control and Foundation Treatment," of the Standard Specifications shall not apply.

When solid rock or other unyielding material is encountered at the planned elevation of the bottom of the bedding, the material below the bottom of the bedding shall be removed to a depth of 1/50 of the height of the embankment over the top of the culvert, but not less than 150 mm nor more than 300 mm. The resulting trench below the bottom of the bedding shall be backfilled with structure backfill material in conformance with the provisions in Section 19-3.06, "Structure Backfill," of the Standard Specifications.

The excavation and backfill below the planned elevation of the bottom of the bedding will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

The Outer Bedding shown on Revised Standard Plan A62DA shall not be compacted prior to placement of the pipe.

10-1.47 MISCELLANEOUS FACILITIES

Concrete flared end sections shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

10-1.48 SLOPE PAVING (CONCRETE)

Slopes under the ends of bridges, where shown on the plans, shall be paved in conformance with the provisions in Section 72-6, "Slope Paving," of the Standard Specifications.

10-1.49 MISCELLANEOUS IRON AND STEEL

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications.

10-1.50 MISCELLANEOUS METAL (BRIDGE)

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Cast-in-place inserts shall be the ferrule loop type.

All metal parts of anchorage devices shall be fabricated from stainless steel conforming to the requirements of ASTM Designation: A 276, Type 304 or 316.

10-1.51 CHAIN LINK FENCE

Chain link fence shall be Types CL-1.5, CL-1.2 modified, CL-1.5 modified and CL-1.8 modified and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

Chain link fence (Type CL-1.5 modified, vinyl clad, 0.9 meter plastic shrubbery insert) and (Type CL-1.8 modified, vinyl clad, 1.8 meter plastic shrubbery insert) shall be vinyl coated and black in color.

MATERIALS

The plastic shrubbery insert for use in chain link fence shall be either American Permahedge or Forevergreen Hedge.

A. American Permahedge (Manufactured by Patrician Products Inc.):

1. Distributor: Sonco Worldwide, Attention: John Coleman, 5000 Windom Road, Bladenburg, Maryland 20710, Telephone: 800-457-6626, Extension 3032, Email to: john@soncoww.com.

| | |
|---|-------------|
| 330 boxes of 1.8 m Permahedge @ \$32.97/box | \$10,880.10 |
| Total | \$10,880.10 |

Each box covers 3 meters of fence.

Freight charges on the above will be 3%.

The above price will be firm for orders placed on or before March 9, 2002.

B. Forevergreen Hedge (Manufactured by National Metal Industries Inc):

1. Distributor: Abbey Fritz Fence Company, Attention: Eric Foland, 4113 Aquarium Place, Baltimore, Maryland 21215, Telephone: 410-358-7575 Extension 113, Fax: 410-358-1132.

| | |
|----------------------------------|-------------|
| 340 boxes of 0.9 m @ \$34.45/box | \$11,713.00 |
| Total | \$11,713.00 |

Each box covers 3 meters of fence.

Freight charges on the above will be approximately \$500.00.

The above price will be firm for orders placed on or before March 16, 2002.

Full compensation for plastic shrubbery inserts shall be considered as included in the contract price paid per meter for the type of fence involved and no additional compensation will be allowed therefor.

10-1.52 BARRIER POST

Removable and fixed barrier posts shall conform to the requirements of Section 75, "Miscellaneous Metal", of the Standard Specifications and these special provisions.

Steel pipes and steel sleeves shall be of the sizes as shown on the plans.

All metal shall be hot-dip galvanized after fabrication in accordance with Section 75-1.05, "Galvanizing," of the Standard Specifications.

Chain shall be 0.062 m proof coil chain galvanized steel. Four links shall be welded to posts and 3 links shall be welded to the pipe sleeve.

All welding shall conform to the requirements of AWS D1.1.

Concrete for footings shall conform to the provisions for minor concrete in Section 90-10, "Minor Concrete," of the Standard Specifications, except that portland cement content shall conform to Class 3 concrete.

Barrier posts shall be painted yellow.

Quantities of removable guard posts will be determined as units from actual count as barrier posts.

The contract unit price paid for barrier post shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing barrier post, complete in place, including painting, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.53 METAL BRIDGE RAILING

Metal railing shall conform to the provisions in Section 83-1, "Railings," of the Standard Specifications and these special provisions.

Metal railing shall be aluminum alloy conforming to ASTM Designation: 6063-T6. The material shall be clear anodized in accordance with Aluminum Association Designation AA-M12C22A42. The minimum anodic coating thickness shall be not less than 35 μm .

The Contractor shall submit complete working drawings for each railing assembly to the Office of Structure Design in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The working drawings shall show complete details of the metal railing and anchorage components. For initial review, 5 sets of drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to said Office for final approval and use during construction.

The working drawings shall be supplemented with calculations for the particular metal railing, as requested by the Engineer. Working drawings shall be 279 mm x 432 mm or 559 mm x 864 mm in size and each drawing and calculation sheet shall include the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Post mile. The design firm's name, address, and phone number shall be shown on the working drawings. Each sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

The Contractor shall allow the Engineer 4 weeks to review the drawings after a complete set has been received.

Within 3 weeks after final working drawing approval, one set of the corrected good quality prints on 75-g/m² (minimum) bond paper (559 mm x 864 mm in size) of all working drawings prepared by the Contractor for each railing assembly shall be furnished to the Office of Structure Design, Documents Unit.

Each shipment of railing materials shall be accompanied by a Certificate of Compliance as provided in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the materials and fabrication involved comply in all respects to the specifications and data submitted in obtaining the approval.

Fabrication shall be performed in conformance with standard shop practices. The completed sections shall be assembled in the shop and shall be checked for straightness, alignment and dimensions.

Metal railing shall conform closely to the horizontal and vertical lines shown on the plans or ordered by the Engineer. Metal railing shall conform to the curvature by means of a series of short chords, from center to center of rail posts, or shall be extruded to match the curvature, at the option of the Contractor. Joints shall be matchmarked. The railing shall present a smooth, uniform appearance in its final position.

The railings shall be carefully erected true to line and grade. Posts and pickets shall be vertical within a tolerance not to exceed 6 mm in 3.0 m. Adjacent rail sections shall align with each other within 1.5 mm.

The finished railing shall be fabricated to prevent manual disassembly.

Alternate methods of fastening railing elements may be employed subject to approval by the Engineer. Connections shall be made in a manner that will present a smooth exterior surface free of projecting bolts, rivets, fasteners or other protuberances. Connections made by welding shall conform to the requirements of Section 10 of the AWS D1.2-83 and the following:

- A. The welding processes and operators involved in fabrication of the aluminum railing shall meet the qualifications test using 6063-T5 test plates following the method described in ASME Boiler and Pressure Vessel Code, Section IX, "Welding Qualification", Part B.
- B. The welding process shall be the tungsten inert gas arc welding method or the consumable electrode inert gas method, at the option of the Contractor. Preheating, when required, shall be performed with temperatures not to exceed 204°C for more than 30 minutes prior to welding. The oxide coating on the aluminum shall be removed immediately before welding by etching or by scratch brushing with a stainless steel wire brush.
- C. Portions of welded joints that have been rejected because of defects shall be repaired only by welding. The defect area shall be removed by chipping, grinding, or machining. Flame cutting defects will not be permitted. Before

welding, the joint will be inspected to insure that all defective weld material has been removed and that the joint is sufficiently accessible to obtain full penetration weld through the joint.

- D. Dirt, grease and lubricants or other deleterious material shall be removed from areas to be welded, by cleaning with a suitable solvent or by vapor degreasing.
- E. All welds shall be ground smooth or filled as required to present a uniform surface without irregularities.

Adequate precautionary measures shall be taken by the Contractor to protect the anodic oxide finish from damage through all operations to final acceptance of the work. Anodized elements damaged from any cause, prior to final acceptance of the work, shall be replaced by the Contractor at his expense.

The portion of aluminum posts embedded in concrete shall be protected with bituminous coating. Bituminous coating shall conform to Section 66-1.03, "Protective Coatings, Linings and Pavings," of the Standard Specifications. Bituminous coating of sufficient length shall be applied for proper protection without exposing the coated surfaces to view. Handling, transporting, and installing of railing sections shall be performed in a manner to prevent abrading anodized or coated surfaces, and any surface so abraded shall be replaced or recoated prior to their installation.

Railing posts shall be grouted into place using a non-shrink cement-grout mixture. Cement and sand shall be of the same type and from the same source as that used in deck concrete. In the event shrinkage of grouted post pocket areas occur visibly, or if color matching is performed unsatisfactorily, such work shall be removed and redone.

Metal railing will be measured by the meter from end to end along the face of the railing.

The contract price paid per meter for metal railing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in constructing metal railing, complete in place, including coating surfaces, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.54 CONCRETE BARRIER

Concrete barriers shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications.

10-1.55 THERMOPLASTIC PAVEMENT MARKING

Thermoplastic pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

At the option of the Contractor, permanent pavement marking tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions may be placed instead of the thermoplastic pavement markings specified herein. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications. If permanent tape is placed instead of thermoplastic pavement markings, the tape will be measured and paid for by the square meter as thermoplastic pavement marking.

10-1.56 PAINT TRAFFIC STRIPE

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

At the option of the Contractor, permanent traffic striping and pavement marking tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions may be placed instead of the painted traffic stripes specified herein. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications. If permanent tape is placed instead of painted traffic stripes, the tape will be measured and paid for by the meter as paint traffic stripe of the number of coats designated in the Engineer's Estimate.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

SECTION 10-2. HIGHWAY PLANTING AND IRRIGATION SYSTEMS

10-2.01 GENERAL

The work performed in connection with highway planting and irrigation systems shall conform to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications and these special provisions.

When fluctuations of water pressure and water supply are encountered during normal working hours, plants shall be watered at other times, as often, and in sufficient amounts as conditions may require to keep the soil and plant roots moist during the life of the contract.

Full compensation for watering plants outside normal working hours shall be considered as included in the contract lump sum prices paid for highway planting and plant establishment work and no additional compensation will be allowed therefor.

COST BREAK-DOWN

The Contractor shall furnish the Engineer a cost break-down for the contract lump sum items of highway planting and irrigation system.

Cost break-downs shall be completed and furnished in the format shown in the samples of the cost break-downs included in this section. Unit descriptions of work shown in the samples are the minimum to be submitted. Additional unit descriptions of work may be designated by the Contractor. If the Contractor elects to designate additional unit descriptions of work, the quantity, value and amount for those units shall be completed in the same manner as for the unit descriptions shown in the samples. The units and quantities given in the samples are to show the manner of preparing the cost break-downs to be furnished by the Contractor.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and their values shall be included in the cost break-downs submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-downs submitted for approval.

No adjustment in compensation will be made in the contract lump sum prices paid for highway planting and irrigation system due to differences between the quantities shown in the cost break-downs furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

The sum of the amounts for the units of work listed in each cost break-down for highway planting and irrigation system work shall be equal to the contract lump sum price bid for the work. Overhead and profit shall be included in each individual unit listed in each cost break-down. Cost break-downs shall be submitted to the Engineer for approval within 15 working days after the contract has been approved. Cost break-downs shall be approved, in writing, by the Engineer before a partial payment for the items of highway planting and irrigation system will be made.

Approved cost break-downs will be used to determine partial payments during the progress of the work and as the basis of calculating the adjustment in compensation for the items of highway planting and irrigation system due to changes ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

HIGHWAY PLANTING COST BREAK-DOWN

Contract No. 11-0479K4

| UNIT DESCRIPTION | UNIT | APPROXIMATE QUANTITY | VALUE | AMOUNT |
|--------------------------------|------|-------------------------|-------|--------|
| ROADSIDE CLEARING | LS | LUMP SUM | | |
| MULCH | M3 | 27 | | |
| COMMERCIAL FERTILIZER (PACKET) | EA | 1608 | | |
| IRON SULFATE | KG | 60 | | |
| PLANT (GROUP A) | EA | 536 | | |
| | | | | |

TOTAL _____

IRRIGATION SYSTEM COST BREAK-DOWN

Contract No. 11-0479K4

| UNIT DESCRIPTION | UNIT | APPROXIMATE QUANTITY | VALUE | AMOUNT |
|---|------|----------------------|-------|--------|
| CHECK, AND TEST EXISTING IRRIGATION FACILITIES | LS | LUMP SUM | | |
| CONTROL AND NEUTRAL CONDUCTORS | LS | LUMP SUM | | |
| 6 STATION IRRIGATION CONTROLLER WITH ENCLOSURE (SOLAR) (POLE MOUNTED) | EA | 1 | | |
| REMOVE EXISTING IRRIGATION FACILITY | LS | LUMP SUM | | |
| REPLACE SOLENOID ON EXISTING REMOTE CONTROL VALVE MASTER | EA | 1 | | |
| 40 MM REMOTE CONTROL VALVE | EA | 4 | | |
| 65 MM GATE VALVE | EA | 4 | | |
| 75 MM GATE VALVE | EA | 1 | | |
| 25 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 384 | | |
| 32 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 216 | | |
| 40 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 200 | | |
| 65 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 212 | | |
| 75 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 570 | | |
| 100 MM PLASTIC PIPE (SUPPLY LINE) (PR-200) | M | 12 | | |
| SPRINKLER (TYPE C-2 MOD) | EA | 536 | | |

TOTAL _____

10-2.02 EXISTING HIGHWAY PLANTING

In addition to the provisions in Section 20 of the Standard Specifications, work performed in connection with existing highway planting shall be in conformance with the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Replacement planting shall conform to the requirements specified under "Preservation of Property" of these special provisions.

10-2.03 EXISTING HIGHWAY IRRIGATION FACILITIES

The work performed in connection with the various existing highway irrigation system facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Water shall be maintained in conformance with the provisions in Section 20-5.025, "Maintain Existing Water Supply," of the Standard Specifications.

LOCATE EXISTING CROSSEOVERS AND CONDUITS

Existing crossovers and conduits shown on the plans to be incorporated in the new work shall be located in conformance with the provisions for locating conduits in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications.

Unless otherwise directed by the Engineer, existing crossovers and conduits shown on the plans to be incorporated in the new work shall be located prior to performing work on irrigation systems.

If debris is encountered in the ends of conduits, the debris shall be removed prior to performing other work in the conduits. Removal of debris within the first one meter in these conduits shall be at the Contractor's expense. If debris is encountered in the conduits more than one meter from the ends of the conduits, the additional debris shall be removed as directed by the Engineer and the removal work will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

CHECK AND TEST EXISTING IRRIGATION FACILITIES

Existing irrigation facilities that are to remain or to be relocated, and that are within those areas where clearing and grubbing or earthwork operations are to be performed, shall be checked for missing or damaged components and proper operation prior to performing clearing and grubbing or earthwork operations. Existing irrigation facilities outside of work areas that are affected by the construction work shall also be checked for proper operation.

A written list of existing irrigation system deficiencies shall be submitted to the Engineer within 5 working days after checking the existing facilities.

Deficiencies found during checking of the existing facilities shall be corrected as directed by the Engineer. Corrective work ordered by the Engineer will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

When existing irrigation facilities are checked, existing backflow preventers to remain shall be tested for proper operation in conformance with the provisions in Section 20-5.03J, "Check and Test Backflow Preventers," of the Standard Specifications.

Length of watering cycles for use of potable water from water meters for checking or testing existing irrigation facilities shall be as determined by the Engineer.

REMOVE EXISTING IRRIGATION FACILITIES

Existing irrigation facilities where shown on the plans to be removed, shall be removed. Facilities that are more than 150 mm below finished grade, may be abandoned in place.

Immediately after disconnecting an existing irrigation facility to be removed or abandoned from an existing facility to remain, the remaining facility shall be capped or plugged, or shall be connected to a new or existing irrigation facility.

Facilities to be removed, shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

10-2.04 HIGHWAY PLANTING

The work performed in connection with highway planting shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

HIGHWAY PLANTING MATERIALS

Mulch

Mulch shall be wood chips.

Commercial Fertilizer

Commercial fertilizer (slow release) shall be a pelleted or granular form, shall be slow release, and shall fall within the following guaranteed chemical analysis range:

| Ingredient | Percentage Range |
|----------------------|------------------|
| Nitrogen | 19 |
| Phosphoric Acid | 6 |
| Water Soluble Potash | 12 |

Commercial fertilizer (packet) shall be slow release and shall be in a biodegradable packet form. Each packet, as shown in the Plant List of the plans, shall have a mass of $10\text{ g} \pm 1\text{ g}$, and shall have the following guaranteed chemical analysis:

| Ingredient | Percentage |
|----------------------|------------|
| Nitrogen | 20 |
| Phosphoric Acid | 10 |
| Water Soluble Potash | 5 |

Commercial fertilizer (packet) will be measured by the actual count of packets in place.

ROADSIDE CLEARING

Prior to preparing planting areas and erosion control (Type D) areas, or commencing irrigation trenching operations for planting areas, trash and debris shall be removed from within the project limits, excluding paved areas, medians and existing planted areas where existing plants are to remain.

Attention is directed to "Order of Work" elsewhere in these special provisions regarding time constraints for this work.

In addition to removing trash and debris, the project area shall be cleared as specified herein:

- A. Weeds shall be killed and removed within vine planting areas.
- B. Roadside clearing for erosion control (Type D) areas shall also consist of mowing weeds in the areas to be receive erosion control until the start of the erosion control operation.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as necessary to maintain the areas, as specified above, in a neat appearance until the start of the plant establishment period. This work shall include the following:

- A. Trash and debris shall be removed.
- B. Rodents shall be controlled.
- C. Weed growth shall be killed before the weeds reach the seed stage of growth or exceed 150 mm in length, except for weeds in erosion control (Type D) areas to be mowed.
- D. Weeds in plant basins, including basin walls, shall be removed by hand pulling, after the plants have been planted.

Weed Control

Weed control shall also conform to the following:

- A. Stolon type weeds shall be killed with glyphosate.
- B. Tumbleweeds shall be removed by hand pulling before the tumbleweeds reach a height of 150 mm.
- C. Removed weeds shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Roadside clearing work shall not include work required to be performed as clearing and grubbing as specified in Section 16, "Clearing and Grubbing," of the Standard Specifications.

PESTICIDES

Pesticides used to control weeds shall conform to the provisions in Section 20-4.026, "Pesticides," of the Standard Specifications. Except as otherwise provided in these special provisions, pesticide use shall be limited to the following materials:

Glyphosate

Glyphosate shall be the formulation for use in aquatic areas. Glyphosate shall be used to kill stolon type weeds.

If the Contractor elects to request the use of other pesticides on this project, the request shall be submitted, in writing, to the Engineer not less than 15 days prior to the intended use of the other pesticides. Except for the pesticides listed in these special provisions, no pesticides shall be used or applied without prior written approval of the Engineer.

Pesticides shall not be applied within the limits of the plant basins. Pesticides shall not be applied in a manner that allows the pesticides to come in contact with the foliage and woody parts of the plants.

PLANTING

Commercial fertilizer and iron sulfate shall be applied or placed at the time of planting and at the rates shown on the plans.

Attention is directed to "Irrigation Systems Functional Test" of these special provisions regarding functional tests of the irrigation systems. Planting shall not be performed in an area until the functional test has been completed for the irrigation system serving that area.

PLANT ESTABLISHMENT WORK

The plant establishment period shall be Type 2 and shall be not less than 120 working days.

After applying erosion control (Type D), plant establishment work for the erosion control areas shall include removing trash, debris and weeds. Weeds shall be removed by hand pulling. Weed removal work shall be coordinated in advance with District Biology personnel to avoid removal of desirable plant species.

Attention is directed to "Relief From Maintenance and Responsibility" in these special provisions regarding relief from maintenance and protection.

One application of commercial fertilizer (slow release) shall be applied to vines during the plant establishment period. Commercial fertilizer shall be applied at the rates shown on the plans and shall be spread with a mechanical spreader wherever possible.

During the plant establishment period, the plants shall be watered utilizing the automatic solar irrigation controller. A seasonal watering schedule shall be submitted to the Engineer for use during the plant establishment period.

Weeds within vine planting areas, shall be controlled by hand pulling.

Weeds outside of plant basins, and paved areas shall be controlled by mowing.

Vines shall be trained onto fences.

At the option of the Contractor, plants of a larger container size than those originally specified may be used for replacement plants during the plant establishment period. The use of plants of a larger container size than those originally specified for replacement plants shall be at the Contractor's expense.

The final inspection shall be performed in conformance with the provisions in Section 5-1.13, "Final Inspection," of the Standard Specifications and shall be completed a minimum of 20 working days before the estimated completion of the contract.

10-2.05 IRRIGATION SYSTEMS

Irrigation systems shall be furnished and installed in conformance with the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications, except materials containing asbestos fibers shall not be used.

Attention is directed to the provisions in "Obstructions" of these special provisions, regarding work over or adjacent to existing underground facilities. Excavation for proposed irrigation facilities shall not be started until the existing underground facilities have been located.

Pipe supply lines shall be pressure tested in conformance with the provisions in Section 20-5.03H, "Pressure Testing," of the Standard Specifications, except the pipe (supply line) on the discharge side of the control valve shall be tested by Method B as specified in Section 20-5.03H(2), "Method B," of the Standard Specifications.

Gate valves, 75 mm and larger in size, shall be furnished with a square lug and shall be operated by use of long shank keys. Prior to acceptance of the contract, 1 long shank key shall be delivered to the Engineer.

Gate valves 75 mm and larger in size shall be flanged type gate valves and shall have a solid bronze or brass wedge.

Pipe flanges used to connect plastic or metal pipe to gate valves shall be metal.

VALVE BOXES

Valve boxes shall conform to the provisions in Section 20-2.24, "Valve Boxes," of the Standard Specifications, except as otherwise provided herein.

Valve boxes shall be precast portland cement concrete, fiberglass or reinforced plastic.

Covers for concrete valve boxes shall be glass fiber reinforced plastic, plastic, or concrete.

Covers for plastic valve boxes shall be glass fiber reinforced plastic or plastic.

Concrete valve boxes shall be identified on the top surface of the covers by stenciling with paint the appropriate abbreviations for the irrigation facilities contained in the valve boxes as shown on the plans. Valve boxes that contain remote control valves shall be identified by the appropriate letters and numbers (controller and station numbers). The entire surface of the cover to receive the label shall be painted with one coat of primer paint. The letters and numbers shall be 50 mm in height. The primer and stenciling paint shall be a commercial quality, epoxy resin base paint. The two colors shall be contrasting.

Glass fiber reinforced plastic or plastic valve boxes shall be identified on the top surface of the covers by branding the appropriate abbreviations for the irrigation facilities contained in the valve boxes as shown on the plans. Valve boxes that contain remote control valves shall be identified by the appropriate letters and numbers (controller and station numbers). The letters and numbers shall be 50 mm in height.

ELECTRIC AUTOMATIC IRRIGATION COMPONENTS

Irrigation Controllers

Attention is directed to the provisions in Section 10-3, "Signals, Lighting and Electrical Systems," of these special provisions, regarding electrical power for irrigation controllers and irrigation controller enclosure cabinets.

The solar automatic irrigation controllers shall conform to the following:

- A. Photovoltaic 6-station irrigation controller, photovoltaic power system, computer with lockable, waterproof, vandal resistant case, shall be manufactured as one complete unit.
- B. All power will be provided by an internal photovoltaic system. Power shall be available for continuous 24-hour operation under the minimum light equivalent to 25 percent of ambient light at 55 degrees latitude.
- C. The computer liquid-crystal display will be powered by a 9-volt battery key mechanism.
- D. The irrigation controller shall have an output digital control pulse at 3.5 volts which will operate a valve solenoid actuator within 300 meter distance.
- E. Irrigation controller shall be fully automatic and capable of operating a complete one day to 90 day cycle, scheduling up to 32 totally independent programs, each having its own start time, day cycle, assigned stations, duration, and program time. Each station shall be capable of 1 minute to 24 hours in one minute increments with separate setting for hours and minutes.
- F. Irrigation controller shall have an emergency program backup system with a user-defined fail-safe program and system parameters which are stored in non-erasable memory.
- G. Irrigation controller shall be installed on a vertical mounting tube, mounted as shown on the plans and in accordance with the manufacturer's specifications.
- H. Low voltage control and neutral conductors and splice connectors shall be manufactured by the same company.
- I. The watering time of each station shall be displayed on the face of the control panel.

The Irrigation controller shall be enclosed in a stainless steel enclosure with inside mounted hinges and an inside mounting clamp. Enclosure shall be equipped with a stainless steel lock. Prior to acceptance of the contract, 2 keys shall be delivered to the Engineer.

Electric Remote Control Valves

Electric remote control valves shall conform to the provisions in Section 20-2.23, "Control Valves," of the Standard Specifications and the following:

- A. Valves shall be glass filled nylon, brass, or bronze construction.
- B. Valves shall be angle pattern (bottom inlet) or straight pattern (side inlet) as shown on the plans.
- C. Valve solenoids for (solar/battery) controller shall be DC latching and operate on 3.5 V and shall be compatible with the irrigation controller.
- D. Replace existing solenoid (AC latching) on existing remote control valve master with a new solenoid (DC latching). The new solenoid shall operate on 3.5 V, and shall be compatible with the irrigation controller.

Pull Boxes

Pull box installations shall conform to the provisions in Section 20-5.027I, "Conductors, Electrical Conduits and Pull Boxes," of the Standard Specifications.

Conductors

Low voltage, as used in this section "Conductors," shall mean 36 V or less.

Low voltage control and neutral conductors in pull boxes and valve boxes, at irrigation controller terminals, and at splices shall be marked with adhesive cloth wrap-around markers.

Markers for the control conductors shall be identified with the appropriate number or letter designations of irrigation controllers and station numbers. Markers for neutral conductors shall be identified with the appropriate number or letter designations of the irrigation controllers.

The color of low voltage neutral and control conductor insulation, except for the striped portions, shall be homogeneous throughout the entire thickness of the insulation.

Insulation for conductors may be UL listed polyethylene conforming to UL44 test standards with a minimum insulation thickness of 1.05 mm for wire sizes 10AWG and smaller.

At the option of the Contractor, other types of splice sealing materials and methods may be used provided other materials and methods have been approved in writing by the Engineer prior to installation of the connectors.

IRRIGATION SYSTEMS FUNCTIONAL TEST

Functional tests for the irrigation controllers and associated automatic irrigation systems shall conform to the provisions in Section 20-5.027J, "Testing," of the Standard Specifications and these special provisions.

Tests shall demonstrate to the Engineer, through one complete cycle of the irrigation controllers in the automatic mode, that the associated automatic components of the irrigation systems operate properly. If automatic components of the irrigation systems fail a functional test, these components shall be repaired at the Contractor's expense and the testing repeated until satisfactory operation is obtained.

Associated automatic components shall include, but not be limited to, remote control valves.

Upon completion of work on an irrigation system, including correction of deficiencies and satisfactory functional tests for the systems involved, the plants to be planted in the area watered by the irrigation system may be planted provided the planting areas have been prepared as specified in these special provisions.

PIPE

Plastic Pipe

Plastic pipe supply lines shall be polyvinyl chloride (PVC) 1120 or 1220 pressure rated pipe with the minimum pressure rating (PR) 200.

Plastic pipe supply lines and fittings that are 75 mm or larger in diameter on the supply side of control valves shall be the rubber ring gasket type, except when pressure rating (PR) 315 plastic pipe supply line is required.

Plastic pipe supply lines less than 75 mm in diameter shall have solvent cemented type joints. Primers shall be used on the solvent cemented type joints.

Plastic pipe supply lines (main) shall have a minimum cover of 0.45 m.

Fittings for plastic pipe supply lines with a pressure rating (PR) of 315 shall be Schedule 80.

SPRINKLERS

Sprinklers shall conform to the type, pattern, material, and operating characteristics listed in the "Sprinkler Schedule" shown on the plans.

Drain pipe for Type C-2 modified sprinklers shall be commercially available rigid perforated polyvinyl chloride (PVC) pipe with the holes spaced not more than 150 mm on center on one side of the pipe.

The drain pipe shall be installed around the sprinkler nipple within the plant basin as shown on the plans with the holes facing the plant root ball.

Pea gravel for backfilling the drain pipe shall be naturally rounded aggregate, clean, washed, dry and free from clay or organic material. The pea gravel shall conform to the following grading:

| Sieve or Screen Size | Percentage passing |
|----------------------|--------------------|
| 19 mm | 100 |
| 12.5 mm | 90-100 |
| 9.5 mm | 40-70 |
| 4.75 mm | 0-15 |
| 2.36 mm | 0-3 |

FINAL IRRIGATION SYSTEM CHECK

A final check of existing and new irrigation facilities shall be performed not more than 20 working days prior to acceptance of the contract.

The length of watering cycles using potable water measured by water meters for the final check of irrigation facilities will be determined by the Engineer.

Remote control valves connected to new irrigation controllers shall be checked for automatic performance when the controllers are in automatic mode.

Unsatisfactory performance of irrigation facilities installed or modified by the Contractor shall be repaired and rechecked at the Contractor's expense until satisfactory performance is obtained, as determined by the Engineer.

Repair or replacement of existing irrigation facilities due to unsatisfactory performance shall conform to the provisions in "Existing Highway Irrigation Facilities" of these special provisions.

Nothing in this section "Final Irrigation System Check" shall relieve the Contractor of full responsibility for making good or repairing defective work or materials found before the formal written acceptance of the entire contract by the Director.

Full compensation for checking the irrigation systems prior to the acceptance of the contract shall be considered as included in the contract lump sum price paid for plant establishment work and no additional compensation will be allowed therefor.

SECTION 10-3. SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Signals and lighting shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

10-3.02 COST BREAK-DOWN

Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these special provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10.3.

The cost break-down shall be submitted to the Engineer for approval within 15 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

10-3.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

Traffic signal system shutdowns shall be limited to periods allowed for lane closures listed or specified in "Maintaining Traffic" of these special provisions.

10-3.04 FOUNDATIONS

Where cast-in-drilled-hole concrete pile foundations are to be constructed in slag aggregate embankments, the diameter of the pile shall be increased to provide a minimum of 75 mm of concrete cover over the reinforcing steel.

Full compensation for the increased diameter of cast-in-drilled-hole concrete pile foundations in slag aggregate embankments, including additional portland cement concrete, and increased drilling and placement costs shall be considered as included in the contract lump sum price paid for the item requiring the cast-in-drilled-hole concrete pile foundation and no additional compensation will be allowed therefor.

10-3.05 STANDARDS, STEEL PEDESTALS AND POSTS

Type 1 standards shall be assembled and set with the handhole on the downstream side of the pole in relation to traffic or as shown on the plans.

10-3.06 CONDUIT

Conduit to be installed underground shall be Type 3 unless otherwise specified.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

| Size Designation for Metallic Type Conduit | Equivalent Size for Rigid Non-metallic Conduit |
|--|--|
| 21 | 20 |
| 27 | 25 |
| 41 | 40 |
| 53 | 50 |
| 63 | 65 |
| 78 | 75 |
| 103 | 100 |

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled with commercial quality concrete, containing not less than 250 kg of portland cement per cubic meter, to not less than 100 mm above the conduit before additional backfill material is placed.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with an approved type of sealing compound.

At locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the "Trenching in Pavement Method."

10-3.07 PULL BOXES

Grout shall not be placed in the bottom of pull boxes.

Where the sump of an existing pull box is disturbed by the Contractor's operation, the sump shall be reconstructed as shown on Standard Plan ES-8.

10-3.08 CONDUCTORS AND WIRING

Splices of conductors shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

Heat-shrink tubing shall be heated as recommended by the manufacturer.

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

OPTICAL DETECTOR CABLE

Optical detector cable (EVC) shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4, 600-V(ac) control cable, 75°C, Type B, and the following:

- A. The cable shall contain 3 conductors, each of which shall be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation. Minimum average insulation thickness shall be 0.63-mm. Insulation of individual conductors shall be color coded: 1-yellow, 1-blue, 1-orange.
- B. The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
- C. The jacket shall be black polyvinyl chloride with minimum ratings of 600 V(ac) and 80°C and a minimum average thickness of 1.1 mm. The jacket shall be marked as required by IPCEA/NEMA.
- D. The finished outside diameter of the cable shall not exceed 8.9 mm.
- E. The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 157 pF per meter at 1000 Hz.
- F. The cable run between each detector and the controller cabinet shall be continuous without splices or shall be spliced only as directed by the detector manufacturer.

10-3.09 NUMBERING ELECTRICAL EQUIPMENT

Self-adhesive numbers (with reflective sheet background) will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

The numbers shall be placed on the equipment where designated by the Engineer.

Where new numbers are to be placed on existing or relocated equipment, the existing numbers shall be removed.

Numbers shall be applied to a clean surface.

Where shown on the plans, equipment numbers shall be placed for all electroliers. On electroliers, the numbers shall be placed as shown on the plans, except that the numbers shall be placed on the side nearest the roadway facing approaching traffic at a height up to 2.5-m above the base plate.

10-3.10 DETECTORS

Loop wire shall be Type 2.

Loop detector lead-in cable shall be Type B.

Slots shall be filled with elastomeric sealant or hot-melt rubberized asphalt sealant.

For Type E detector loops, sides of the slot shall be vertical and the minimum radius of the slot entering and leaving the circular part of the loop shall be 40 mm. Slot width shall be a maximum of 20 mm.

The depth of loop sealant above the top of the uppermost loop wire in the sawed slots shall be 50 mm, minimum.

10-3.11 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to the District Recycle Center, 11900 Singer Lane, Spring Valley, CA 91978 and stockpiled.

The Contractor shall provide the equipment, as necessary, to safely unload and stockpile the material. A minimum of 2 working days' notice shall be given to the Engineer and the District Recycle Coordinator, telephone (619) 467-3293, prior to delivery.

10-3.12 PAYMENT

The contract lump sum price or prices paid for signal and lighting shall include highway lighting at intersections in connection with signals only.

Other roadway lighting on the project shall be considered as included in the contract lump sum price paid for lighting.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

SECTION 11. MODIFIED STANDARD SPECIFICATION SECTIONS

SECTION 11-1. (BLANK)

SECTION 11-2. PORTLAND CEMENT CONCRETE

11-2.01 GENERAL

Portland cement concrete shall conform to the provisions in this Section 11-2, "Portland Cement Concrete," and the section entitled "Portland Cement Concrete" in Section 8, "Materials," of these special provisions. Section 90, "Portland Cement Concrete," of the Standard Specifications is deleted. Section 90, "Portland Cement Concrete," of the Standard Specifications is amended to read as follows.

SECTION 90: PORTLAND CEMENT CONCRETE

90-1 GENERAL

90-1.01 DESCRIPTION

- Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.

- The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete. Concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

- Unless otherwise specified, cementitious material shall be a combination of cement and mineral admixture. Cementitious material shall be either:

1. "Type IP (MS) Modified" cement; or
2. A combination of "Type II Modified" portland cement and mineral admixture; or
3. A combination of Type V portland cement and mineral admixture.

• Type III portland cement shall be used only as allowed in the special provisions or with the approval of the Engineer.

- Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.
- Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.
- Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.
- Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.
- Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.
- Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic meter of concrete in structures or portions of structures shall conform to the following:

| Use | Cementitious Material Content (kg/m ³) |
|--|---|
| Concrete designated by compressive strength: | |
| Deck slabs and slab spans of bridges | 400 min., 475 max. |
| Roof sections of exposed top box culverts | 400 min., 475 max. |
| Other portions of structures | 350 min., 475 max. |
| Concrete not designated by compressive strength: | |
| Deck slabs and slab spans of bridges | 400 min. |
| Roof sections of exposed top box culverts | 400 min. |
| Prestressed members | 400 min. |
| Seal courses | 400 min. |
| Other portions of structures | 350 min. |
| Concrete for precast members | 350 min., 550 max. |

• Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be designated by compressive strength. If the plans show a 28-day compressive strength that is 28 MPa or greater, an additional 14 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans that are 25 MPa or less are shown for design information only and are not a requirement for acceptance of the concrete.

• Concrete designated by compressive strength shall be proportioned such that the concrete will attain the strength shown on the plans or specified in the special provisions.

• Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

• Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.

• If any concrete has a cementitious material, portland cement, or mineral admixture content that is less than the minimum required, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.55 for each kilogram of cementitious material, portland cement, or mineral admixture that is less than the minimum required. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions will be made based on the results of California Test 518.

• The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.

90-2 MATERIALS

90-2.01 CEMENT

• Unless otherwise specified, cement shall be either "Type IP (MS) Modified" cement, "Type II Modified" portland cement or Type V portland cement.

- "Type IP (MS) Modified" cement shall conform to the requirements for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate and uniform blend of Type II cement and not more than 35 percent by mass of mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

- "Type II Modified" portland cement shall conform to the requirements for Type II portland cement in ASTM Designation: C 150.

- In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

- A. The cement shall not contain more than 0.60 percent by mass of alkalis, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O , when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in conformance with the requirements in ASTM Designation: C 114;
- B. The autoclave expansion shall not exceed 0.50 percent; and
- C. Mortar, containing the cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent, except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members, or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

- Type III and Type V portland cements shall conform to the requirements in ASTM Designation: C 150 and the additional requirements listed above for "Type II Modified" portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

- Cement used in the manufacture of cast-in-place concrete for exposed surfaces of like elements of a structure shall be from the same cement mill.

- Cement shall be protected from exposure to moisture until used. Sacked cement shall be piled to permit access for tally, inspection, and identification of each shipment.

- Adequate facilities shall be provided to assure that cement meeting the provisions specified in this Section 90-2.01 shall be kept separate from other cement in order to prevent any but the specified cement from entering the work. Safe and suitable facilities for sampling cement shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper, in conformance with California Test 125.

- If cement is used prior to sampling and testing as provided in Section 6-1.07, "Certificates of Compliance," and the cement is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the cement manufacturer or supplier of the cement. If the cement is used in ready-mixed concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.

- Cement furnished without a Certificate of Compliance shall not be used in the work until the Engineer has had sufficient time to make appropriate tests and has approved the cement for use.

90-2.02 AGGREGATES

- Aggregates shall be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.
- Natural aggregates shall be thoroughly and uniformly washed before use.
- The Contractor, at the Contractor's expense, shall provide safe and suitable facilities, including necessary splitting devices for obtaining samples of aggregates, in conformance with California Test 125.

- Aggregates shall be of such character that it will be possible to produce workable concrete within the limits of water content provided in Section 90-6.06, "Amount of Water and Penetration."

- Aggregates shall have not more than 10 percent loss when tested for soundness in conformance with the requirements in California Test 214. The soundness requirement for fine aggregate will be waived, provided that the durability index, D_f , of the fine aggregate is 60, or greater, when tested for durability in conformance with California Test 229.

- If the results of any one or more of the Cleanness Value, Sand Equivalent, or aggregate grading tests do not meet the requirements specified for "Operating Range" but all meet the "Contract Compliance" requirements, the placement of concrete shall be suspended at the completion of the current pour until tests or other information indicate that the next material to be used in the work will comply with the requirements specified for "Operating Range."

- If the results of either or both the Cleanness Value and coarse aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete that is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State \$4.60 per cubic meter for paving concrete and \$7.20 per cubic meter for all other concrete for the concrete represented

by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.

- If the results of either or both the Sand Equivalent and fine aggregate grading tests do not meet the requirements specified for "Contract Compliance," the concrete which is represented by the tests shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place, and the Contractor shall pay to the State \$4.60 per cubic meter for paving concrete and \$7.20 per cubic meter for all other concrete for the concrete represented by these tests and left in place. The Department may deduct the amount from any moneys due, or that may become due, the Contractor under the contract.

- The 2 preceding paragraphs apply individually to the "Contract Compliance" requirements for coarse aggregate and fine aggregate. When both coarse aggregate and fine aggregate do not conform to the "Contract Compliance" requirements, both paragraphs shall apply. The payments specified in those paragraphs shall be in addition to any payments made in conformance with the provisions in Section 90-1.01, "Description."

- No single Cleanness Value, Sand Equivalent or aggregate grading test shall represent more than 250 m³ of concrete or one day's pour, whichever is smaller.

- Aggregates specified for freeze-thaw resistance shall pass the freezing and thawing test, California Test 528.

- The Contractor shall notify the Engineer of the proposed source of freeze-thaw resistant concrete aggregates at least 4 months before intended use. Should the Contractor later propose a different source of concrete aggregates, the Contractor shall again notify the Engineer at least 4 months before intended use. Blending of fine or coarse aggregates from untested sources with acceptable aggregates will not be permitted. Provisions for the time of submission of samples as provided in Section 40-1.015, "Cement Content," are superseded by the foregoing.

- Concurrently with notification of proposed sources of freeze-thaw resistant concrete aggregates, the Contractor shall furnish samples in the quantity ordered by the Engineer. The samples shall be secured under the direct supervision of the Engineer. Samples from existing stockpiles of processed aggregate shall be taken from washed materials and shall be visibly damp. Samples from materials in place in a material source shall be taken at depths from the existing surface that will ensure the presence of the full quantity of ground water. Excavations for the purpose of securing samples shall be made to the full depth of intended source operations. Samples shall be protected against loss of contained water until they are delivered to the Engineer.

- The Engineer will waive the above freeze-thaw test and the 4-month advance notice, required in this Section, provided aggregates are to be obtained from sources that have previously passed this test and test results are currently applicable.

- No extension of contract time will be allowed for the time required to perform the freezing and thawing test.

- When the source of an aggregate is changed, except for pavement concrete, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using the aggregates. When the source of an aggregate is changed for pavement concrete, the Engineer shall be allowed sufficient time to adjust the mix, and the aggregates shall not be used until necessary adjustments are made.

90-2.02A Coarse Aggregate

- Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, crushed air-cooled iron blast furnace slag or combinations thereof. Crushed air-cooled blast furnace slag shall not be used in reinforced or prestressed concrete.

- Coarse aggregate shall conform to the following quality requirements:

| Tests | California Test | Requirements |
|---|-----------------|--------------|
| Loss in Los Angeles Rattler (after 500 revolutions) | 211 | 45% max. |
| Cleanness Value | | |
| Operating Range | 227 | 75 min. |
| Contract Compliance | 227 | 71 min. |

- In lieu of the above Cleanness Value requirements, a Cleanness Value "Operating Range" limit of 71, minimum, and a Cleanness Value "Contract Compliance" limit of 68, minimum, will be used to determine the acceptability of the coarse aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. coarse aggregate sampled at the completion of processing at the aggregate production plant had a Cleanness Value of not less than 82 when tested by California Test 227; and

2. prequalification tests performed in conformance with the requirements in California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.02B Fine Aggregate

- Fine aggregate shall consist of natural sand, manufactured sand produced from larger aggregate or a combination thereof. Manufactured sand shall be well graded.
- Fine aggregate shall conform to the following quality requirements:

| Test | California Test | Requirements |
|--|-----------------|---------------------------|
| Organic Impurities | 213 | Satisfactory ^a |
| Mortar Strengths Relative to Ottawa Sand | 515 | 95%, min. |
| Sand Equivalent: | | |
| Operating Range | 217 | 75, min. |
| Contract Compliance | 217 | 71, min. |

a Fine aggregate developing a color darker than the reference standard color solution may be accepted if it is determined by the Engineer, from mortar strength tests, that a darker color is acceptable.

- In lieu of the above Sand Equivalent requirements, a Sand Equivalent "Operating Range" limit of 71 minimum and a Sand Equivalent "Contract Compliance" limit of 68 minimum will be used to determine the acceptability of the fine aggregate if the Contractor furnishes a Certificate of Compliance, as provided in Section 6-1.07, "Certificates of Compliance," certifying that:

1. fine aggregate sampled at the completion of processing at the aggregate production plant had a Sand Equivalent value of not less than 82 when tested by California Test 217; and
2. prequalification tests performed in conformance with California Test 549 indicated that the aggregate would develop a relative strength of not less than 95 percent and would have a relative shrinkage not greater than 105 percent, based on concrete.

90-2.03 WATER

- In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1300 parts per million of sulfates as SO₄, when tested in conformance with California Test 417. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1300 parts per million of sulfates as SO₄, when tested in conformance with California Test 417. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with the requirements in ASTM Designation: C 191 or ASTM Designation: C 266 or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with the requirements in ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with the requirements in ASTM Designation: C 109.

- In non-reinforced concrete work, the water for curing, for washing aggregates and for mixing shall be free from oil and shall not contain more than 2000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, or more than 1500 parts per million of sulfates as SO₄, when tested in conformance with California Test 417.

- In addition to the above provisions, water for curing concrete shall not contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

- Water reclaimed from mixer wash-out operations may be used in mixing concrete. The water shall not contain coloring agents or more than 300 parts per million of alkalis (Na₂O + 0.658 K₂O) as determined on the filtrate. The specific gravity of the water shall not exceed 1.03 and shall not vary more than ±0.010 during a day's operations.

90-2.04 ADMIXTURE MATERIALS

- Admixture materials shall conform to the requirements in the following ASTM Designations:

- A. Chemical Admixtures—ASTM Designation: C 494.

- B. Air-entraining Admixtures—ASTM Designation: C 260.
- C. Calcium Chloride—ASTM Designation: D 98.
- D. Mineral Admixtures—Coal fly ash; raw or calcined natural pozzolan as specified in ASTM Designation: C618; silica fume conforming to the requirements in ASTM Designation: C1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

• Unless otherwise specified in the special provisions, mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

90-3 AGGREGATE GRADINGS

90-3.01 GENERAL

- Before beginning concrete work, the Contractor shall submit in writing to the Engineer the gradation of the primary aggregate nominal sizes that the Contractor proposes to furnish. If a primary coarse aggregate or the fine aggregate is separated into 2 or more sizes, the proposed gradation shall consist of the gradation for each individual size, and the proposed proportions of each individual size, combined mathematically to indicate one proposed gradation. The proposed gradation shall meet the grading requirements shown in the table in this section, and shall show the percentage passing each of the sieve sizes used in determining the end result.
- The Engineer may waive, in writing, the gradation requirements in this Section 90-3.01 and in Sections 90-3.02, "Coarse Aggregate Grading," 90-3.03, "Fine Aggregate Grading," and 90-3.04, "Combined Aggregate Gradings," if, in the Engineer's opinion, furnishing the gradation is not necessary for the type or amount of concrete work to be constructed.
- Gradations proposed by the Contractor shall be within the following percentage passing limits:

| Primary Aggregate Nominal Size | Sieve Size | Limits of Proposed Gradation |
|--------------------------------|------------|------------------------------|
| 37.5-mm x 19-mm | 25-mm | 19 - 41 |
| 25-mm x 4.75-mm | 19-mm | 52 - 85 |
| 25-mm x 4.75-mm | 9.5-mm | 15 - 38 |
| 12.5-mm x 4.75-mm | 9.5-mm | 40 - 78 |
| 9.5-mm x 2.36-mm | 9.5-mm | 50 - 85 |
| Fine Aggregate | 1.18-mm | 55 - 75 |
| Fine Aggregate | 600-μm | 34 - 46 |
| Fine Aggregate | 300-μm | 16 - 29 |

- Should the Contractor change the source of supply, the Contractor shall submit in writing to the Engineer the new gradations before their intended use.

90-3.02 COARSE AGGREGATE GRADING

- The grading requirements for coarse aggregates are shown in the following table for each size of coarse aggregate:

| Sieve Sizes | Percentage Passing Primary Aggregate Nominal Sizes | | | | | | | |
|-------------|--|---------------------|-----------------|---------------------|-------------------|---------------------|------------------|---------------------|
| | 37.5-mm x 19-mm | | 25-mm x 4.75-mm | | 12.5-mm x 4.75-mm | | 9.5-mm x 2.36-mm | |
| | Operating Range | Contract Compliance | Operating Range | Contract Compliance | Operating Range | Contract Compliance | Operating Range | Contract Compliance |
| 50-mm | 100 | 100 | — | — | — | — | — | — |
| 37.5-mm | 88-100 | 85-100 | 100 | 100 | — | — | — | — |
| 25-mm | x ± 18 | X ± 25 | 88-100 | 86-100 | — | — | — | — |
| 19-mm | 0-17 | 0-20 | X ± 15 | X ± 22 | 100 | 100 | — | — |
| 12.5-mm | — | — | — | — | 82-100 | 80-100 | 100 | 100 |
| 9.5-mm | 0-7 | 0-9 | X ± 15 | X ± 22 | X ± 15 | X ± 22 | X ± 15 | X ± 20 |
| 4.75-mm | — | — | 0-16 | 0-18 | 0-15 | 0-18 | 0-25 | 0-28 |
| 2.36-mm | — | — | 0-6 | 0-7 | 0-6 | 0-7 | 0-6 | 0-7 |

- In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."
- Coarse aggregate for the 37.5-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," shall be furnished in 2 or more primary aggregate nominal sizes. Each primary aggregate nominal size may be separated into 2 sizes and stored separately, provided that the combined material conforms to the grading requirements for that particular primary aggregate nominal size.
- When the 25-mm, maximum, combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," is to be used, the coarse aggregate may be separated into 2 sizes and stored separately, provided that the combined material shall conform to the grading requirements for the 25-mm x 4.75-mm primary aggregate nominal size.

90-3.03 FINE AGGREGATE GRADING

- Fine aggregate shall be graded within the following limits:

| Sieve Sizes | Percentage Passing | |
|-------------|--------------------|---------------------|
| | Operating Range | Contract Compliance |
| 9.5-mm | 100 | 100 |
| 4.75-mm | 95-100 | 93-100 |
| 2.36-mm | 65-95 | 61-99 |
| 1.18-mm | X ± 10 | X ± 13 |
| 600-μm | X ± 9 | X ± 12 |
| 300-μm | X ± 6 | X ± 9 |
| 150-μm | 2-12 | 1-15 |
| 75-μm | 0-8 | 0-10 |

- In the above table, the symbol X is the gradation that the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."
- In addition to the above required grading analysis, the distribution of the fine aggregate sizes shall be such that the difference between the total percentage passing the 1.18-mm sieve and the total percentage passing the 600-μm sieve shall be between 10 and 40, and the difference between the percentage passing the 600-μm and 300-μm sieves shall be between 10 and 40.
- Fine aggregate may be separated into 2 or more sizes and stored separately, provided that the combined material conforms to the grading requirements specified in this Section 90-3.03.

90-3.04 COMBINED AGGREGATE GRADINGS

- Combined aggregate grading limits shall be used only for the design of concrete mixes. Concrete mixes shall be designed so that aggregates are combined in proportions that shall produce a mixture within the grading limits for combined aggregates as specified herein. Within these limitations, the relative proportions shall be as ordered by the Engineer, except as otherwise provided in Section 90-1.01, "Description."
- The combined aggregate grading used in portland cement concrete pavement shall be the 37.5-mm, maximum grading.
- The combined aggregate grading used in concrete for structures and other concrete items, except when specified otherwise in these specifications or the special provisions, shall be either the 37.5-mm, maximum grading, or the 25-mm, maximum grading, at the option of the Contractor.

Grading Limits of Combined Aggregates

| Sieve Sizes | Percentage Passing | | | |
|-------------|--------------------|------------|--------------|-------------|
| | 37.5-mm Max. | 25-mm Max. | 12.5-mm Max. | 9.5-mm Max. |
| 50-mm | 100 | — | — | — |
| 37.5-mm | 90-100 | 100 | — | — |
| 25-mm | 50-86 | 90-100 | — | — |
| 19-mm | 45-75 | 55-100 | 100 | — |
| 12.5-mm | — | — | 90-100 | 100 |
| 9.5-mm | 38-55 | 45-75 | 55-86 | 50 - 100 |
| 4.75-mm | 30-45 | 35-60 | 45-63 | 45 - 63 |
| 2.36-mm | 23-38 | 27-45 | 35-49 | 35 - 49 |
| 1.18-mm | 17-33 | 20-35 | 25-37 | 25 - 37 |
| 600-µm | 10-22 | 12-25 | 15-25 | 15 - 25 |
| 300-µm | 4-10 | 5-15 | 5-15 | 5 - 15 |
| 150-µm | 1-6 | 1-8 | 1-8 | 1 - 8 |
| 75-µm | 0-3 | 0-4 | 0-4 | 0 - 4 |

- Changes from one grading to another shall not be made during the progress of the work unless permitted by the Engineer.

90-4 ADMIXTURES

90-4.01 GENERAL

- Admixtures used in portland cement concrete shall conform to and be used in conformance with the provisions in this Section 90-4 and the special provisions. Admixtures shall be used when specified or ordered by the Engineer and may be used at the Contractor's option as provided herein.
- Chemical admixtures and air-entraining admixtures containing chlorides as Cl in excess of one percent by mass of admixture, as determined by California Test 415, shall not be used in prestressed or reinforced concrete.
- Calcium chloride shall not be used in concrete containing steel reinforcement or other embedded metals.
- Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.
- Admixtures shall be uniform in properties throughout their use in the work. Should it be found that an admixture as furnished is not uniform in properties, its use shall be discontinued.
- If more than one admixture is used, the admixtures shall be compatible with each other so that the desirable effects of all admixtures used will be realized.

90-4.02 MATERIALS

- Admixture materials shall conform to the provisions in Section 90-2.04, "Admixture Materials."

90-4.03 ADMIXTURE APPROVAL

- No admixture brand shall be used in the work unless it is on the Department's current list of approved brands for the type of admixture involved.
- Admixture brands will be considered for addition to the approved list if the manufacturer of the admixture submits to the Transportation Laboratory a sample of the admixture accompanied by certified test results demonstrating that the admixture complies with the requirements in the appropriate ASTM Designation and these specifications. The sample shall be sufficient to permit performance of all required tests. Approval of admixture brands will be dependent upon a determination as to compliance with the requirements, based on the certified test results submitted, together with tests the Department may elect to perform.
- When the Contractor proposes to use an admixture of a brand and type on the current list of approved admixture brands, the Contractor shall furnish a Certificate of Compliance from the manufacturer, as provided in Section 6-1.07, "Certificates of Compliance," certifying that the admixture furnished is the same as that previously approved. If a previously approved admixture is not accompanied by a Certificate of Compliance, the admixture shall not be used in the work until the Engineer has had sufficient time to make the appropriate tests and has approved the admixture for use. The Engineer may take samples for testing at any time, whether or not the admixture has been accompanied by a Certificate of Compliance.
- If a mineral admixture is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the manufacturer or supplier of the mineral admixture. If the mineral admixture is used in ready-mix concrete or in precast

concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of the concrete or product.

90-4.04 REQUIRED USE OF CHEMICAL ADMIXTURES AND CALCIUM CHLORIDE

- When the use of a chemical admixture or calcium chloride is specified or ordered by the Engineer, the admixture shall be used at the dosage specified or ordered, except that if no dosage is specified or ordered, the admixture shall be used at the dosage normally recommended by the manufacturer of the admixture.
- Calcium chloride shall be dispensed in liquid, flake, or pellet form. Calcium chloride dispensed in liquid form shall conform to the provisions for dispensing liquid admixtures in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures."

90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES

- The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:
 - A. When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass, except that the resultant cementitious material content shall be not less than 300 kilograms per cubic meter; and
 - B. When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.
- Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements in ASTM Designation: C 494, may be used in portland cement concrete. Inclusion in the mix design submitted for approval will not be required provided that the admixture is added to counteract changing conditions that contribute to delayed setting of the portland cement concrete, and the use or change in dosage of the admixture is approved in writing by the Engineer.

90-4.06 REQUIRED USE OF AIR-ENTRAINING ADMIXTURES

- When air-entrainment is specified or ordered by the Engineer, the air-entraining admixture shall be used in amounts to produce a concrete having the specified air content as determined by California Test 504.

90-4.07 OPTIONAL USE OF AIR-ENTRAINING ADMIXTURES

- When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent, and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

90-4.08 REQUIRED USE OF MINERAL ADMIXTURES

- Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material.
- The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C 618.
- The amounts of cement and mineral admixture used in cementitious material shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:
 - A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content;
 - B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
 - 1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix;

2. When the calcium oxide content of a mineral admixture is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix;
 3. When a mineral admixture that conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix
- C. The total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

90-4.09 BLANK

90-4.10 PROPORTIONING AND DISPENSING LIQUID ADMIXTURES

- Chemical admixtures and air-entraining admixtures shall be dispensed in liquid form. Dispensers for liquid admixtures shall have sufficient capacity to measure at one time the prescribed quantity required for each batch of concrete. Each dispenser shall include a graduated measuring unit into which liquid admixtures are measured to within ± 5 percent of the prescribed quantity for each batch. Dispensers shall be located and maintained so that the graduations can be accurately read from the point at which proportioning operations are controlled to permit a visual check of batching accuracy prior to discharge. Each measuring unit shall be clearly marked for the type and quantity of admixture.
- Each liquid admixture dispensing system shall be equipped with a sampling device consisting of a valve located in a safe and readily accessible position such that a sample of the admixture may be withdrawn slowly by the Engineer.
- If more than one liquid admixture is used in the concrete mix, each liquid admixture shall have a separate measuring unit and shall be dispensed by injecting equipment located in such a manner that the admixtures are not mixed at high concentrations and do not interfere with the effectiveness of each other. When air-entraining admixtures are used in conjunction with other liquid admixtures, the air-entraining admixture shall be the first to be incorporated into the mix.
- When automatic proportioning devices are required for concrete pavement, dispensers for liquid admixtures shall operate automatically with the batching control equipment. The dispensers shall be equipped with an automatic warning system in good operating condition that will provide a visible or audible signal at the point at which proportioning operations are controlled when the quantity of admixture measured for each batch of concrete varies from the preselected dosage by more than 5 percent, or when the entire contents of the measuring unit are not emptied from the dispenser into each batch of concrete.
- Unless liquid admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow into the stream of water so that the admixtures are well dispersed throughout the batch, except that air-entraining admixtures may be dispensed directly into moist sand in the batching bins provided that adequate control of the air content of the concrete can be maintained.
- Liquid admixtures requiring dosages greater than 2.5 L/m^3 shall be considered to be water when determining the total amount of free water as specified in Section 90-6.06, "Amount of Water and Penetration."
- Special admixtures, such as "high range" water reducers that may contribute to a high rate of slump loss, shall be measured and dispensed as recommended by the admixture manufacturer and as approved by the Engineer.

90-4.11 STORAGE, PROPORTIONING, AND DISPENSING OF MINERAL ADMIXTURES

- Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.
- Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.
- Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.
- When concrete is completely mixed in stationary paving mixers, the mineral admixture shall be weighed in a separate weigh hopper conforming to the provisions for cement weigh hoppers and charging and discharging mechanisms in Section 90-5.03A, "Proportioning for Pavement," and the mineral admixture and cement shall be introduced simultaneously into the mixer proportionately with the aggregate. If the mineral admixture is not weighed in a separate weigh hopper, the

Contractor shall provide certification that the stationary mixer is capable of mixing the cement, admixture, aggregates and water uniformly prior to discharge. Certification shall contain the following:

- A. Test results for 2 compressive strength test cylinders of concrete taken within the first one-third and 2 compressive strength test cylinders of concrete taken within the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;"
- B. Calculations demonstrating that the difference in the averages of 2 compressive strengths taken in the first one-third is no greater than 7.5 percent different than the averages of 2 compressive strengths taken in the last one-third of the concrete discharged from a single batch from the stationary paving mixer. Strength tests and cylinder preparation will be in conformance with the provisions of Section 90-9, "Compressive Strength;" and
- C. The mixer rotation speed and time of mixing prior to discharge that are required to produce a mix that meets the requirements above.

90-5 PROPORTIONING

90-5.01 STORAGE OF AGGREGATES

- Aggregates shall be stored or stockpiled in such a manner that separation of coarse and fine particles of each size shall be avoided and also that the various sizes shall not become intermixed before proportioning.

- Aggregates shall be stored or stockpiled and handled in a manner that shall prevent contamination by foreign materials. In addition, storage of aggregates at batching or mixing facilities that are erected subsequent to the award of the contract and that furnish concrete to the project shall conform to the following:

- A. Intermingling of the different sizes of aggregates shall be positively prevented. The Contractor shall take the necessary measures to prevent intermingling. The preventive measures may include, but are not necessarily limited to, physical separation of stockpiles or construction of bulkheads of adequate length and height; and
- B. Contamination of aggregates by contact with the ground shall be positively prevented. The Contractor shall take the necessary measures to prevent contamination. The preventive measures shall include, but are not necessarily limited to, placing aggregates on wooden platforms or on hardened surfaces consisting of portland cement concrete, asphalt concrete, or cement treated material.

- In placing aggregates in storage or in moving the aggregates from storage to the weigh hopper of the batching plant, any method that may cause segregation, degradation, or the combining of materials of different gradings that will result in any size of aggregate at the weigh hopper failing to meet the grading requirements, shall be discontinued. Any method of handling aggregates that results in excessive breakage of particles shall be discontinued. The use of suitable devices to reduce impact of falling aggregates may be required by the Engineer.

90-5.02 PROPORTIONING DEVICES

- Weighing, measuring, or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, automatic weighing systems shall comply with the requirements for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." Automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.

- Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to ensure their accuracy.

- Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the mass of each batch of material shall not vary from the mass designated by the Engineer by more than the tolerances specified herein.

- Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ± 0.5 percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated mass or volume.

- The mass indicated for any batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch mass of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch masses; and
- B. Cement shall be within 1.0 percent of its designated batch mass. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch mass. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch mass, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch masses; and
- C. Water shall be within 1.5 percent of its designated mass or volume.

- Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5-kg graduations.

90-5.03 PROPORTIONING

- Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture, and water as provided in these specifications. Aggregates shall be proportioned by mass.

- At the time of batching, aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

- Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

- Bulk "Type IP (MS) Modified" cement shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

- Bulk cement and mineral admixture may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

- When cement and mineral admixtures are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

- The scales and weigh hoppers for bulk weighing cement, mineral admixture, or cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

- For batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate scale and indicator for weighing each size of aggregate.
- B. Single box and scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

- In order to check the accuracy of batch masses, the gross mass and tare mass of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

90-5.03A Proportioning for Pavement

- Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to these specifications.

- The Contractor shall install and maintain in operating condition an electronically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.

- The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with masses that are within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- When interlocks are required for cement and mineral admixture charging mechanisms and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the mass of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture, or cement plus mineral admixture into the aggregate as directed by the Engineer.
- When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.
- Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and so that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.
- When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required mass is discharged into the weigh box, after which the gate shall automatically close and lock.
- The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

90-6 MIXING AND TRANSPORTING

90-6.01 GENERAL

- Concrete shall be mixed in mechanically operated mixers, except that when permitted by the Engineer, batches not exceeding 0.25 m³ may be mixed by hand methods in conformance with the provisions in Section 90-6.05, "Hand-Mixing."
- Equipment having components made of aluminum or magnesium alloys that would have contact with plastic concrete during mixing, transporting, or pumping of portland cement concrete shall not be used.
- Concrete shall be homogeneous and thoroughly mixed, and there shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.
- Uniformity of concrete mixtures will be determined by differences in penetration as determined by California Test 533, or slump as determined by ASTM Designation: C 143, and by variations in the proportion of coarse aggregate as determined by California Test 529.
- When the mix design specifies a penetration value, the difference in penetration, determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed 10 mm. When the mix design specifies a slump value, the difference in slump, determined by comparing slump tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed the values given in the table below. Variation in the proportion of coarse aggregate will be determined by comparing the results of tests of 2 samples of mixed concrete from the same batch or truck mixer load and the difference between the 2 results shall not exceed 100 kg per cubic meter of concrete.

| Average Slump | Maximum Permissible Difference |
|-------------------------------|--------------------------------|
| Less than 100-mm | 25-mm |
| 100-mm to 150-mm | 38-mm |
| Greater than 150-mm to 225-mm | 50-mm |

- The Contractor, at the Contractor's expense, shall furnish samples of the freshly mixed concrete and provide satisfactory facilities for obtaining the samples.

90-6.02 MACHINE MIXING

- Concrete mixers may be of the revolving drum or the revolving blade type, and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. Mixers and agitators that have an accumulation of hard concrete or mortar shall not be used.

- The temperature of mixed concrete, immediately before placing, shall be not less than 10°C or more than 32°C. Aggregates and water shall be heated or cooled as necessary to produce concrete within these temperature limits. Neither aggregates nor mixing water shall be heated to exceed 65°C. If ice is used to cool the concrete, discharge of the mixer will not be permitted until all ice is melted.

- The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one - fourth of the specified mixing time.

- Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions that reduce or vary the required quantity of cementitious material in the concrete mixture.

- Paving and stationary mixers shall be operated with an automatic timing device. The timing device and discharge mechanism shall be interlocked so that during normal operation no part of the batch will be discharged until the specified mixing time has elapsed.

- The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

- The size of batch shall not exceed the manufacturer's guaranteed capacity.

- When producing concrete for pavement or base, suitable batch counters shall be installed and maintained in good operating condition at jobsite batching plants and stationary mixers. The batch counters shall indicate the exact number of batches proportioned and mixed.

- Concrete shall be mixed and delivered to the jobsite by means of one of the following combinations of operations:

- A. Mixed completely in a stationary mixer and the mixed concrete transported to the point of delivery in truck agitators or in non-agitating hauling equipment (central-mixed concrete).

- B. Mixed partially in a stationary mixer, and the mixing completed in a truck mixer (shrink-mixed concrete).

- C. Mixed completely in a truck mixer (transit-mixed concrete).

- D. Mixed completely in a paving mixer.

- Agitators may be truck mixers operating at agitating speed or truck agitators. Each mixer and agitator shall have attached thereto in a prominent place a metal plate or plates on which is plainly marked the various uses for which the equipment is designed, the manufacturer's guaranteed capacity of the drum or container in terms of the volume of mixed concrete and the speed of rotation of the mixing drum or blades.

- Truck mixers shall be equipped with electrically or mechanically actuated revolution counters by which the number of revolutions of the drum or blades may readily be verified.

- When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements for transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing in a central plant.

90-6.03 TRANSPORTING MIXED CONCRETE

- Mixed concrete may be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturer of the equipment as agitating speed, or in non-agitating hauling equipment, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable for adequate placement and consolidation in place, and provided the mixed concrete after hauling to the delivery point conforms to the provisions in Section 90-6.01, "General."

- Truck agitators shall be loaded not to exceed the manufacturer's guaranteed capacity and shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling.

- Bodies of non-agitating hauling equipment shall be constructed so that leakage of the concrete mix, or any part thereof, will not occur at any time.

- Concrete hauled in open-top vehicles shall be protected during hauling against rain or against exposure to the sun for more than 20 minutes when the ambient temperature exceeds 24°C.

- No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced.

- The rate of discharge of mixed concrete from truck mixer-agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.

- When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours or before 250 revolutions of the drum or blades, whichever occurs first, after the introduction of the cement

to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time allowed may be less than 1.5 hours.

- When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

- Each load of concrete delivered at the jobsite shall be accompanied by a weighmaster certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load, and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weighmaster certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.

- Weighmaster certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on a 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be "line feed, carriage return" (LFCR) and "one line, separate record" with allowances for sufficient fields to satisfy the amount of data required by these specifications.

- The Contractor may furnish a weighmaster certificate accompanied by a separate certificate that lists the actual batch masses or measurements for a load of concrete provided that both certificates are imprinted with the same non-repeating load number that is unique to the contract and delivered to the jobsite with the load.

- Weighmaster certificates furnished by the Contractor shall conform to the provisions in Section 9-1.01, "Measurement of Quantities."

90-6.04 TIME OR AMOUNT OF MIXING

- Mixing of concrete in paving or stationary mixers shall continue for the required mixing time after all ingredients, except water and admixture, if added with the water, are in the mixing compartment of the mixer before any part of the batch is released. Transfer time in multiple drum mixers shall not be counted as part of the required mixing time.

- The required mixing time, in paving or stationary mixers, of concrete used for concrete structures, except minor structures, shall be not less than 90 seconds or more than 5 minutes, except that when directed by the Engineer in writing, the requirements of the following paragraph shall apply.

- The required mixing time, in paving or stationary mixers, except as provided in the preceding paragraph, shall be not less than 50 seconds or more than 5 minutes.

- The minimum required revolutions at the mixing speed for transit-mixed concrete shall not be less than that recommended by the mixer manufacturer, but in no case shall the number of revolutions be less than that required to consistently produce concrete conforming to the provisions for uniformity in Section 90-6.01, "General."

90-6.05 HAND-MIXING

- Hand-mixed concrete shall be made in batches of not more than 0.25 m³ and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

90-6.06 AMOUNT OF WATER AND PENETRATION

- The amount of water used in concrete mixes shall be regulated so that the penetration of the concrete as determined by California Test 533 or the slump of the concrete as determined by ASTM Designation: C 143 is within the "Nominal" values shown in the following table. When the penetration or slump of the concrete is found to exceed the nominal values listed, the mixture of subsequent batches shall be adjusted to reduce the penetration or slump to a value within the nominal range shown. Batches of concrete with a penetration or slump exceeding the maximum values listed shall not be used in the work. When Type F or Type G chemical admixtures are added to the mix, the penetration requirements shall not apply and the slump shall not exceed 225 mm after the chemical admixtures are added.

| Type of Work | Nominal | | Maximum | |
|------------------------------------|------------------|------------|------------------|------------|
| | Penetration (mm) | Slump (mm) | Penetration (mm) | Slump (mm) |
| Concrete Pavement | 0-25 | — | 40 | — |
| Non-reinforced concrete facilities | 0-35 | — | 50 | — |
| Reinforced concrete structures | | | | |
| Sections over 300-mm thick | 0-35 | — | 65 | — |
| Sections 300-mm thick or less | 0-50 | — | 75 | — |
| Concrete placed under water | — | 150-200 | — | 225 |
| Cast-in-place concrete piles | 65-90 | 130-180 | 100 | 200 |

- The amount of free water used in concrete shall not exceed 183 kg/m^3 , plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m^3 . • The term free water is defined as the total water in the mixture minus the water absorbed by the aggregates in reaching a saturated surface-dry condition.

- Where there are adverse or difficult conditions that affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic meter of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 kg of water per added 100 kg of cementitious material per cubic meter. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

- The equipment for supplying water to the mixer shall be constructed and arranged so that the amount of water added can be measured accurately. Any method of discharging water into the mixer for a batch shall be accurate within 1.5 percent of the quantity of water required to be added to the mix for any position of the mixer. Tanks used to measure water shall be designed so that water cannot enter while water is being discharged into the mixer and discharge into the mixer shall be made rapidly in one operation without dribbling. All equipment shall be arranged so as to permit checking the amount of water delivered by discharging into measured containers.

90-7 CURING CONCRETE

90-7.01 METHODS OF CURING

- Newly placed concrete shall be cured by the methods specified in this Section 90-7.01 and the special provisions.

90-7.01A Water Method

- The concrete shall be kept continuously wet by the application of water for a minimum curing period of 7 days after the concrete has been placed.

- When a curing medium consisting of cotton mats, rugs, carpets, or earth or sand blankets is to be used to retain the moisture, the entire surface of the concrete shall be kept damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate on the concrete in a quantity sufficient to cause a flow or wash the surface. At the expiration of the curing period, the concrete surfaces shall be cleared of all curing mediums.

- When concrete bridge decks and flat slabs are to be cured without the use of a curing medium, the entire surface of the bridge deck or slab shall be kept damp by the application of water with an atomizing nozzle as specified in the preceding paragraph, until the concrete has set, after which the entire surface of the concrete shall be sprinkled continuously with water for a period of not less than 7 days.

90-7.01B Curing Compound Method

- Surfaces of the concrete that are exposed to the air shall be sprayed uniformly with a curing compound.
- Curing compounds to be used shall be as follows:

1. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B, except the resin type shall be poly-alpha-methylstyrene.
2. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class B.
3. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class A.
4. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class B.
5. Non-pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 1, Class A.

6. Non-pigmented curing compound with fugitive dye conforming to the requirements in ASTM Designation: C 309, Type 1-D, Class A.

- The infrared scan for the dried vehicle from curing compound (1) shall match the infrared scan on file at the Transportation Laboratory.
- The loss of water for each type of curing compound, when tested in conformance with the requirements in California Test 534, shall not be more than 0.15-kg/m² in 24 hours or more than 0.45-kg/m² in 72 hours.
- The curing compound to be used will be specified elsewhere in these specifications or in the special provisions.
- When the use of curing compound is required or permitted elsewhere in these specifications or in the special provisions and no specific kind is specified, any of the curing compounds listed above may be used.
- Curing compound shall be applied at a nominal rate of 3.7 m²/L, unless otherwise specified.
- At any point, the application rate shall be within ± 1.2 m²/L of the nominal rate specified, and the average application rate shall be within ± 0.5 m²/L of the nominal rate specified when tested in conformance with the requirements in California Test 535. Runs, sags, thin areas, skips, or holidays in the applied curing compound shall be evidence that the application is not satisfactory.
- Curing compounds shall be applied using power operated spray equipment. The power operated spraying equipment shall be equipped with an operational pressure gage and a means of controlling the pressure. Hand spraying of small and irregular areas that are not reasonably accessible to mechanical spraying equipment, in the opinion of the Engineer, may be permitted.
- The curing compound shall be applied to the concrete following the surface finishing operation, immediately before the moisture sheen disappears from the surface, but before any drying shrinkage or craze cracks begin to appear. In the event of any drying or cracking of the surface, application of water with an atomizing nozzle as specified in Section 90-7.01A, "Water Method," shall be started immediately and shall be continued until application of the compound is resumed or started; however, the compound shall not be applied over any resulting freestanding water. Should the film of compound be damaged from any cause before the expiration of 7 days after the concrete is placed in the case of structures and 72 hours in the case of pavement, the damaged portion shall be repaired immediately with additional compound.
- At the time of use, compounds containing pigments shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. A paddle shall be used to loosen all settled pigment from the bottom of the container, and a power driven agitator shall be used to disperse the pigment uniformly throughout the vehicle.
- Agitation shall not introduce air or other foreign substance into the curing compound.
- The manufacturer shall include in the curing compound the necessary additives for control of sagging, pigment settling, leveling, de-emulsification, or other requisite qualities of a satisfactory working material. Pigmented curing compounds shall be manufactured so that the pigment does not settle badly, does not cake or thicken in the container, and does not become granular or curdled. Settlement of pigment shall be a thoroughly wetted, soft, mushy mass permitting the complete and easy vertical penetration of a paddle. Settled pigment shall be easily redispersed, with minimum resistance to the sideways manual motion of the paddle across the bottom of the container, to form a smooth uniform product of the proper consistency.
- Curing compounds shall remain sprayable at temperatures above 4°C and shall not be diluted or altered after manufacture.
- The curing compound shall be packaged in clean 210-L barrels or round 19-L containers or shall be supplied from a suitable storage tank located at the jobsite. The containers shall comply with "Title 49, Code of Federal Regulations, Hazardous Materials Regulations." The 210-L barrels shall have removable lids and airtight fasteners. The 19-L containers shall be round and have standard full open head and bail. Lids with bungholes shall not be permitted. On-site storage tanks shall be kept clean and free of contaminants. Each tank shall have a permanent system designed to completely redisperse settled material without introducing air or other foreign substances.
- Steel containers and lids shall be lined with a coating that will prevent destructive action by the compound or chemical agents in the air space above the compound. The coating shall not come off the container or lid as skins. Containers shall be filled in a manner that will prevent skinning. Plastic containers shall not react with the compound.
- Each container shall be labeled with the manufacturer's name, kind of curing compound, batch number, volume, date of manufacture, and volatile organic compound (VOC) content. The label shall also warn that the curing compound containing pigment shall be well stirred before use. Precautions concerning the handling and the application of curing compound shall be shown on the label of the curing compound containers in conformance with the Construction Safety Orders and General Industry Safety Orders of the State of California.
- Containers of curing compound shall be labeled to indicate that the contents fully comply with the rules and regulations concerning air pollution control in the State of California.
- When the curing compound is shipped in tanks or tank trucks, a shipping invoice shall accompany each load. The invoice shall contain the same information as that required herein for container labels.

- Curing compound will be sampled by the Engineer at the source of supply or at the jobsite or at both locations.
- Curing compound shall be formulated so as to maintain the specified properties for a minimum of one year. The Engineer may require additional testing before use to determine compliance with these specifications if the compound has not been used within one year or whenever the Engineer has reason to believe the compound is no longer satisfactory.
- Tests will be conducted in conformance with the latest ASTM test methods and methods in use by the Transportation Laboratory.

90-7.01C Waterproof Membrane Method

- The exposed finished surfaces of concrete shall be sprayed with water, using a nozzle that so atomizes the flow that a mist and not a spray is formed, until the concrete has set, after which the curing membrane shall be placed. The curing membrane shall remain in place for a period of not less than 72 hours.
- Sheeting material for curing concrete shall conform to the requirements in AASHTO Designation: M 171 for white reflective materials.
- The sheeting material shall be fabricated into sheets of such width as to provide a complete cover for the entire concrete surface. Joints in the sheets shall be securely cemented together in such a manner as to provide a waterproof joint. The joint seams shall have a minimum lap of 100 mm.
- The sheets shall be securely weighted down by placing a bank of earth on the edges of the sheets or by other means satisfactory to the Engineer.
- Should any portion of the sheets be broken or damaged before the expiration of 72 hours after being placed, the broken or damaged portions shall be immediately repaired with new sheets properly cemented into place.
- Sections of membrane that have lost their waterproof qualities or have been damaged to such an extent as to render them unfit for curing the concrete shall not be used.

90-7.01D Forms-In-Place Method

- Formed surfaces of concrete may be cured by retaining the forms in place. The forms shall remain in place for a minimum period of 7 days after the concrete has been placed, except that for members over 0.5-m in least dimension the forms shall remain in place for a minimum period of 5 days.
- Joints in the forms and the joints between the end of forms and concrete shall be kept moisture tight during the curing period. Cracks in the forms and cracks between the forms and the concrete shall be resealed by methods subject to the approval of the Engineer.

90-7.02 CURING PAVEMENT

- The entire exposed area of the pavement, including edges, shall be cured by the waterproof membrane method, or curing compound method using curing compound (1) or (2) as the Contractor may elect. Should the side forms be removed before the expiration of 72 hours following the start of curing, the exposed pavement edges shall also be cured. If the pavement is cured by means of the curing compound method, the sawcut and all portions of the curing compound that have been disturbed by sawing operations shall be restored by spraying with additional curing compound.
- Curing shall commence as soon as the finishing process provided in Section 40-1.10, "Final Finishing," has been completed. The method selected shall conform to the provisions in Section 90-7.01, "Methods of Curing."
- When the curing compound method is used, the compound shall be applied to the entire pavement surface by mechanical sprayers. Spraying equipment shall be of the fully atomizing type equipped with a tank agitator that provides for continual agitation of the curing compound during the time of application. The spray shall be adequately protected against wind, and the nozzles shall be so oriented or moved mechanically transversely as to result in the minimum specified rate of coverage being applied uniformly on exposed faces. Hand spraying of small and irregular areas, and areas inaccessible to mechanical spraying equipment, in the opinion of the Engineer, will be permitted. When the ambient air temperature is above 15°C, the Contractor shall fog the surface of the concrete with a fine spray of water as specified in Section 90-7.01A, "Water Method." The surface of the pavement shall be kept moist between the hours of 10:00 a.m. and 4:30 p.m. on the day the concrete is placed. However, the fogging done after the curing compound has been applied shall not begin until the compound has set sufficiently to prevent displacement. Fogging shall be discontinued if ordered in writing by the Engineer.

90-7.03 CURING STRUCTURES

- Newly placed concrete for cast-in-place structures, other than highway bridge decks, shall be cured by the water method, the forms-in-place method, or, as permitted herein, by the curing compound method, in conformance with the provisions in Section 90-7.01, "Methods of Curing."
- The curing compound method using a pigmented curing compound may be used on concrete surfaces of construction joints, surfaces that are to be buried underground, and surfaces where only Ordinary Surface Finish is to be

applied and on which a uniform color is not required and that will not be visible from a public traveled way. If the Contractor elects to use the curing compound method on the bottom slab of box girder spans, the curing compound shall be curing compound (1).

- The top surface of highway bridge decks shall be cured by both the curing compound method and the water method. The curing compound shall be curing compound (1). The curing compound shall be applied progressively during the deck finishing operations immediately after finishing operations are completed on each individual portion of the deck. The water cure shall be applied not later than 4 hours after completion of deck finishing or, for portions of the decks on which finishing is completed after normal working hours, the water cure shall be applied not later than the following morning.

- Concrete surfaces of minor structures, as defined in Section 51-1.02, "Minor Structures," shall be cured by the water method, the forms-in-place method or the curing compound method.

- When deemed necessary by the Engineer during periods of hot weather, water shall be applied to concrete surfaces being cured by the curing compound method or by the forms-in-place method, until the Engineer determines that a cooling effect is no longer required. Application of water for this purpose will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."

90-7.04 CURING PRECAST CONCRETE MEMBERS

- Precast concrete members shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing." Curing shall be provided for the minimum time specified for each method or until the concrete reaches its design strength, whichever is less. Steam curing may also be used for precast members and shall conform to the following provisions:

- A. After placement of the concrete, members shall be held for a minimum 4-hour presteaming period. If the ambient air temperature is below 10°C, steam shall be applied during the presteaming period to hold the air surrounding the member at a temperature between 10°C and 32°C.
- B. To prevent moisture loss on exposed surfaces during the presteaming period, members shall be covered as soon as possible after casting or the exposed surfaces shall be kept wet by fog spray or wet blankets.
- C. Enclosures for steam curing shall allow free circulation of steam about the member and shall be constructed to contain the live steam with a minimum moisture loss. The use of tarpaulins or similar flexible covers will be permitted, provided they are kept in good repair and secured in such a manner as to prevent the loss of steam and moisture.
- D. Steam at the jets shall be at low pressure and in a saturated condition. Steam jets shall not impinge directly on the concrete, test cylinders, or forms. During application of the steam, the temperature rise within the enclosure shall not exceed 22°C per hour. The curing temperature throughout the enclosure shall not exceed 65°C and shall be maintained at a constant level for a sufficient time necessary to develop the required transfer strength. Control cylinders shall be covered to prevent moisture loss and shall be placed in a location where temperature is representative of the average temperature of the enclosure.
- E. Temperature recording devices that will provide an accurate, continuous, permanent record of the curing temperature shall be provided. A minimum of one temperature recording device per 60 m of continuous bed length will be required for checking temperature.
- F. Members in pretension beds shall be detensioned immediately after the termination of steam curing while the concrete and forms are still warm, or the temperature under the enclosure shall be maintained above 15°C until the stress is transferred to the concrete.
- G. Curing of precast concrete will be considered completed after termination of the steam curing cycle.

90-7.05 CURING PRECAST PRESTRESSED CONCRETE PILES

- Newly placed concrete for precast prestressed concrete piles shall be cured in conformance with the provisions in Section 90-7.04, "Curing Precast Concrete Members," except that piles with a class designation ending in C (corrosion resistant) shall be cured as follows:

- A. Piles shall be either steam cured or water cured. If water curing is used, the piles shall be kept continuously wet by the application of water in conformance with the provisions in Section 90-7.01A, "Water Method."
- B. If steam curing is used, the steam curing provisions in Section 90-7.04, "Curing Precast Concrete Members," shall apply except that the piles shall be kept continuously wet for their entire length for a period of not less than 3 days, including the holding and steam curing periods.

90-7.06 CURING SLOPE PROTECTION

- Concrete slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."
- Concreted-rock slope protection shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing," or with a blanket of earth kept wet for 72 hours, or by sprinkling with a fine spray of water every 2 hours during the daytime for a period of 3 days.

90-7.07 CURING MISCELLANEOUS CONCRETE WORK

- Exposed surfaces of curbs shall be cured by pigmented curing compounds as specified in Section 90-7.01B, "Curing Compound Method."
- Concrete sidewalks, gutter depressions, island paving, curb ramps, driveways, and other miscellaneous concrete areas shall be cured in conformance with any of the methods specified in Section 90-7.01, "Methods of Curing."
- Shotcrete shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."
- Mortar and grout shall be cured by keeping the surface damp for 3 days.
- After placing, the exposed surfaces of sign structure foundations, including pedestal portions, if constructed, shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in Section 90-7.01, "Methods of Curing."

90-8 PROTECTING CONCRETE

90-8.01 GENERAL

- In addition to the provisions in Section 7-1.16, "Contractor's Responsibility for the Work and Materials," the Contractor shall protect concrete as provided in this Section 90-8.
- Concrete shall not be placed on frozen or ice-coated ground or subgrade nor on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints.
- Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash of the concrete surface, unless the Contractor provides adequate protection against damage.
- Concrete that has been frozen or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

90-8.02 PROTECTING CONCRETE STRUCTURES

- Structure concrete and shotcrete used as structure concrete shall be maintained at a temperature of not less than 7°C for 72 hours after placing and at not less than 4°C for an additional 4 days. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.

90-8.03 PROTECTING CONCRETE PAVEMENT

- Pavement concrete shall be maintained at a temperature of not less than 4°C for 72 hours. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.
- Except as provided in Section 7-1.08, "Public Convenience," the Contractor shall protect concrete pavement against construction and other activities that abrade, scar, discolor, reduce texture depth, lower coefficient of friction, or otherwise damage the surface. Stockpiling, drifting, or excessive spillage of soil, gravel, petroleum products, and concrete or asphalt mixes on the surface of concrete pavement is prohibited unless otherwise specified in these specifications, the special provisions or permitted by the Engineer.
- When ordered by the Engineer or shown on the plans or specified in the special provisions, pavement crossings shall be constructed for the convenience of public traffic. The material and work necessary for the construction of the crossings, and their subsequent removal and disposal, will be paid for at the contract unit prices for the items of work involved and if there are no contract items for the work involved, payment for pavement crossings will be made by extra work as provided in Section 4-1.03D, "Extra Work." Where public traffic will be required to cross over the new pavement, Type III portland cement may be used in concrete, if permitted in writing by the Engineer. The pavement may be opened to traffic as soon as the concrete has developed a modulus of rupture of 3.8 MPa. The modulus of rupture will be determined by California Test 523.
- No traffic or Contractor's equipment, except as hereinafter provided, will be permitted on the pavement before a period of 10 days has elapsed after the concrete has been placed, nor before the concrete has developed a modulus of rupture

of at least 3.8 MPa. Concrete that fails to attain a modulus of rupture of 3.8 MPa within 10 days shall not be opened to traffic until directed by the Engineer.

- Equipment for sawing weakened plane joints will be permitted on the pavement as specified in Section 40-1.08B, "Weakened Plane Joints."

- When requested in writing by the Contractor, the tracks on one side of paving equipment will be permitted on the pavement after a modulus of rupture of 2.4 MPa has been attained, provided that:

- A. Unit pressure exerted on the pavement by the paver shall not exceed 135 kPa;
- B. Tracks with cleats, grousers, or similar protuberances shall be modified or shall travel on planks or equivalent protective material, so that the pavement is not damaged; and
- C. No part of the track shall be closer than 0.3-m from the edge of pavement.

- In case of visible cracking of, or other damage to the pavement, operation of the paving equipment on the pavement shall be immediately discontinued.

- Damage to the pavement resulting from early use of pavement by the Contractor's equipment as provided above shall be repaired by the Contractor at the Contractor's expense.

- The State will furnish the molds and machines for testing the concrete for modulus of rupture, and the Contractor, at the Contractor's expense, shall furnish the material and whatever labor the Engineer may require.

90-9 COMPRESSIVE STRENGTH

90-9.01 GENERAL

- Concrete compressive strength requirements consist of a minimum strength that shall be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or the special provisions or are shown on the plans.

- The compressive strength of concrete will be determined from test cylinders that have been fabricated from concrete sampled in conformance with the requirements of ASTM Designation: C 172. Test cylinders will be molded and initially field cured in conformance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in conformance with the requirements of ASTM Designation: C 39. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

- When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in conformance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

- When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$14 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$20 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. Concrete represented by a single test that indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."

- If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but is 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer

that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the requirements in ASTM Designation: C 42.

- No single compressive strength test shall represent more than 250 m³.
- When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders that have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.
- When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.
- Certified test data, in order to be acceptable, shall indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.
- Trial batch test reports, in order to be acceptable, shall indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches that were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.
- Tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. Equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.
- The certified test data and trial batch test reports shall include the following information:
 - A. Date of mixing.
 - B. Mixing equipment and procedures used.
 - C. The size of batch in cubic meters and the mass, type, and source of all ingredients used.
 - D. Penetration of the concrete.
 - E. The air content of the concrete if an air-entraining admixture is used.
 - F. The age at time of testing and strength of all concrete cylinders tested.
- Certified test data and trial batch test reports shall be signed by an official of the firm that performed the tests.
- When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.
- After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making changes that, in the judgment of the Engineer, could result in a strength of concrete below that specified.
- The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.
- When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

90-10 MINOR CONCRETE

90-10.01 GENERAL

- Concrete for minor structures, slope paving, curbs, sidewalks and other concrete work, when designated as minor concrete on the plans, in the specifications, or in the contract item, shall conform to the provisions specified herein.

- The Engineer, at the Engineer's discretion, will inspect and test the facilities, materials and methods for producing the concrete to ensure that minor concrete of the quality suitable for use in the work is obtained.

90-10.02 MATERIALS

- Minor concrete shall conform to the following requirements:

90-10.02A Cementitious Material

- Cementitious material shall conform to the provisions in Section 90-1.01, "Description."

90-10.02B Aggregate

- Aggregate shall be clean and free from deleterious coatings, clay balls, roots, and other extraneous materials.
- The Contractor shall submit to the Engineer for approval, a grading of the combined aggregate proposed for use in the minor concrete. After acceptance of the grading, aggregate furnished for minor concrete shall conform to that grading, unless a change is authorized in writing by the Engineer.
 - The Engineer may require the Contractor to furnish periodic test reports of the aggregate grading furnished. The maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 37.5 mm or smaller than 19 mm.
 - The Engineer may waive, in writing, the gradation requirements in this Section 90-10.02B, if, in the Engineer's opinion, the furnishing of the gradation is not necessary for the type or amount of concrete work to be constructed.

90-10.02C Water

- Water used for washing, mixing, and curing shall be free from oil, salts, and other impurities that would discolor or etch the surface or have an adverse affect on the quality of the concrete.

90-10.02D Admixtures

- The use of admixtures shall conform to the provisions in Section 90-4, "Admixtures."

90-10.03 PRODUCTION

- Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice that will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and that conforms to requirements specified herein. Recognized standards of good practice are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or the Department.
 - The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."
 - The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.
 - Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32°C will be considered conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.
 - The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.
 - The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.
 - Each load of ready-mixed concrete shall be accompanied by a weighmaster certificate that shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weighmaster certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.
 - A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

90-10.04 CURING MINOR CONCRETE

- Curing minor concrete shall conform to the provisions in Section 90-7, "Curing Concrete."

90-10.05 PROTECTING MINOR CONCRETE

- Protecting minor concrete shall conform to the provisions in Section 90-8, "Protecting Concrete," except the concrete shall be maintained at a temperature of not less than 4°C for 72 hours after placing.

90-10.06 MEASUREMENT AND PAYMENT

- Minor concrete will be measured and paid for in conformance with the provisions specified in the various sections of these specifications covering concrete construction when minor concrete is specified in the specifications, shown on the plans, or indicated by contract item in the Engineer's Estimate.

90-11 MEASUREMENT AND PAYMENT

90-11.01 MEASUREMENT

- Portland cement concrete will be measured in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- When it is provided that concrete will be measured at the mixer, the volume in cubic meters shall be computed as the total mass of the batch in kilograms divided by the density of the concrete in kilograms per cubic meter. The total mass of the batch shall be calculated as the sum of all materials, including water, entering the batch. The density of the concrete will be determined in conformance with the requirements in California Test 518.

90-11.02 PAYMENT

- Portland cement concrete will be paid for in conformance with the provisions specified in the various sections of these specifications covering construction requiring concrete.
- Full compensation for furnishing and incorporating admixtures required by these specifications or the special provisions will be considered as included in the contract prices paid for the concrete involved and no additional compensation will be allowed therefor.
- Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D, "Extra Work."
- Should the Contractor use admixtures in conformance with the provisions in Section 90-4.05, "Optional Use of Chemical Admixtures," or Section 90-4.07, "Optional Use of Air-entraining Admixtures," or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them into the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

SECTION 12. (BLANK)

SECTION 13 RAILROAD RELATIONS AND INSURANCE

SECTION 13-1. RELATIONS WITH RAILROAD COMPANY

13-1.01 GENERAL.

The San Diego Metropolitan Transit Development Board (MTDB), the San Diego & Arizona Eastern Railway Company (SD&AE Rwy), the San Diego & Imperial Valley Railroad (SD&IV), and the San Diego Trolley, Inc. (SDTI), shall hereinafter be collectively referred to as "RAILROAD."

It is expected that the RAILROAD will cooperate with the Contractor to the end that the work may be handled in an efficient manner. However, except for the additional compensation provided for hereinafter for delays in completion of specific units of work to be performed by the RAILROAD, the Contractor shall have no claim for damages, extension of time, or extra compensation in the event his work is held up by any of the work to be performed by the RAILROAD.

13-1.02 RAILROAD REQUIREMENTS

The Contractor shall cooperate with the RAILROAD where work is over or under the tracks, or within the limits of RAILROAD property, in order to expedite the work and to avoid interference with the operation of railroad equipment.

The Contractor shall notify Mrs. Diane M. White, Right of Way Agent at MTDB at 1255 Imperial Avenue, Suite 1000, San Diego, CA 92101-7490, and the State's Engineer, in writing, at least fourteen (14) calendar days before performing any work on, over, or adjacent to the property or tracks of RAILROAD, as well as notifying the above personnel one (1) working day after completion of the work covered by this Contract.

The Contractor must obtain a right-of-entry permit from the RAILROAD prior to performing any work over or adjacent to the Railroad's property and tracks.

The Contractor shall contact Mrs. Diane M. White, Right of Way Agent of MTDB at 1255 Imperial Avenue, Suite 1000, San Diego, CA 92101-7490, Tel (619) 557-4549 for the right-of-entry permit. The Contractor shall not begin any work over the RAILROAD's tracks or property until the right-of-entry permit has been approved by the RAILROAD. The Contractor, upon receipt of the right-of-entry permit, approved by the RAILROAD, shall furnish the State's Engineer with two (2) copies of the executed right-of-entry permit.

The Contractor shall arrange a pre-construction meeting at least five (5) days prior to start of work with Mrs. Diane M. White, of MTDB, Tel. (619) 557-4549 or Mr. Russ Desia, of SDTI, at Tel. (619) 559-4908, to review procedures and possible RAILROAD conflicts in the vicinity of the proposed work.

The Contractor shall cooperate with any special conditions requested in writing by the RAILROAD up to five (5) working days after the pre-construction meeting.

The details of construction, including proposed method of setup to perform the work, together with falsework plans, if any, affecting RAILROAD property and movement of trains, not included in the contract plans, shall be submitted to the RAILROAD for approval and shall not be undertaken until approval by RAILROAD is given.

The SDTI operates a light rail transit service between 4:00 a.m. and 2:00 a.m. the following day and SD&AE Rwy operates freight rail service during the hours SDTI is not operating. The Contractor agrees to coordinate on a daily basis a reasonable access to all RAILROAD facilities with contract operators during the hours of the light rail transit service. Contractor agrees that no work by himself or his authorized agent will interfere RAILROAD operations.

All work shall be performed in accordance with applicable CPUC regulations and MTDB Design Criteria. Any work that deviates from CPUC regulations will require an exemption in writing from the CPUC's Rail Transit Safety Section.

The Contractor shall perform his work in such manner and at such times as to not endanger, interfere, or interrupt the operation of the tracks of the RAILROAD and traffic moving on such tracks, as well as wires, signals and other property of the RAILROAD, its tenants or licensees, at or in the vicinity of the work.

The Contractor shall comply with the rules and regulations of the RAILROAD or the instructions of its representatives in relation to the proper manner of protecting the tracks and property of RAILROAD, its tenants or licensees, at and in the vicinity of the work during the period of construction.

The Contractor shall take protective measures necessary to prevent any material, equipment or debris from falling on RAILROAD's right of way or on RAILROAD's equipment or trains operating on RAILROAD's right of way. Any damage to RAILROAD facilities resulting from Contractor's operations will be repaired or replaced by the RAILROAD and the cost of such repairs, damage or replacement shall be deducted from the Contractor's progress and final pay estimates.

The Contractor shall not pile or store any materials or park any equipment, when not in use, closer to the center of the nearest railroad track than permitted by the following permanent clearances:

15'-0" horizontally from centerline of track,
23'-0" vertically above top of rail.

The placement above top of rail of forms, bracing or other construction supports, placement or driving of piles, shall not be closer to the center of the nearest railroad track than permitted by the following temporary construction clearances:

8'-6" horizontally from centerline of track
1'-0" horizontally from the foundation of a catenary pole
23'-0" vertically above the top of rail.

Any infringement on the above temporary construction clearances due to the Contractor's operations shall be admitted to the RAILROAD for approval by way of the State's Engineer, and shall not be undertaken until approved by RAILROAD and until the State's Engineer has obtained any necessary authorization from the Public Utilities Commission for the infringement. No extension of time or extra compensation will be allowed in the event the Contractor's work is delayed pending RAILROAD approval and Public Utilities Commission authorization.

When the temporary vertical clearance is less than 23'-0" above top of rail, RAILROAD shall have the option of installing tell-tales or other protective devices RAILROAD deems necessary for protection of railroad trainmen or traffic. RAILROAD's cost for installing tell-tales or other protective devices shall be borne by the Contractor.

Six sets of working drawings showing details of construction affecting RAILROAD's tracks and property, including those for falsework or scaffolding over the tracks or shoring of excavations near tracks, not included in the contract plans, shall be furnished by the Contractor to the State's Engineer and the Contractor shall not begin such work until notified by the State's Engineer that Mrs. Diane M. White, the Right of Way Agent of the RAILROAD has indicated that such plans have been approved by the RAILROAD. In no case shall the Contractor be relieved of responsibility for results obtained by the use of said plans.

No temporary vehicular crossing over RAILROAD's tracks shall be installed or used by the Contractor without prior written permission of the RAILROAD.

The Contractor shall, upon completion of the work covered by this contract, to be performed by Contractor upon premises or over the tracks of the RAILROAD, promptly remove from premises of RAILROAD, at or above RAILROAD's right of way, all of Contractor's tools, implements, falsework and/or scaffolding and other materials, whether brought upon said premises by said Contractor or any subcontractor, employee or agent of Contractor or of any subcontractor, and cause said premises to be left in a clean and presentable condition.

13-1.03 PROTECTION OF RAILROAD FACILITIES

1. RAILROAD representatives, inspectors, flagmen or watchmen, will be provided by the RAILROAD to protect its facilities, property and movements of its trains or engines when:
 - (a) When any part of any equipment is standing or being operated within 10 feet, measured horizontally, from centerline of any track on which trains may operate, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
 - (b) For any excavation below elevation of track subgrade if, in the opinion of RAILROAD's representative, track or other railroad facilities may be subject to settlement or movement.
 - (c) During any clearing, grubbing, or grading in proximity to RAILROAD which, in the opinion of Railroad's representative, may endanger railroad facilities or operations.
 - (d) During any of Contractor's operations when, in the opinion of RAILROAD's representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines or pipe lines, may be endangered.
2. Contractor shall submit RAILROAD's "Flagman Request Form" to Mr. Russ Desai at SDTI at least two (2) working days prior to his need of RAILROAD Flagmen. RAILROAD will furnish such personnel or other protective services when, in the opinion of RAILROAD's representative, railroad facilities, including, but not limited to, tracks, equipment operating on RAILROAD's tracks, buildings, signals or wire lines may be endangered.
- 3 (a) The cost of flagging provided by the RAILROAD during the period of constructing that portion located on or above RAILROAD property, as deemed necessary for the protection of RAILROAD's facilities and trains, will be borne by the State for a period of 10 working days beginning on the date work commences on or above property of RAILROAD. The Contractor shall pay to State liquidated damages in the sum of \$500 per day for each day in

excess of the above 10 working days the Contractor works on or over RAILROAD property, and which requires flagging protection of RAILROAD's facilities and trains.

- (b) The cost of all RAILROAD personnel (other than that required for inspection and flagging), equipment and facilities deemed necessary by the RAILROAD and provided by the RAILROAD for the protection of railroad facilities and trains during the period of construction within RAILROAD right of way and the cost of installing protective devices, if any, in the case of impaired vertical or horizontal clearance, as set for in Section 13-1.02, "RAILROAD REQUIREMENTS," of these Special Provisions shall be borne by the Contractor. The Contractor shall be responsible for payment of all costs incurred for any damages to railroad roadbed, tracks, property, and RAILROAD's equipment operating on its property, resulting from use, occupancy, or presence of Contractor, employees or agents, or subcontractors on or about the construction sites.

4. RAILROAD will submit its final bills to Contractor for cost incurred pursuant to Paragraph 3(B).

13-1.04 WORK BY RAILROAD

No work by the RAILROAD, other than engineering inspection and flagging, is anticipated.

13-1.05 DELAYS BY RAILROAD

No delays by RAILROAD are anticipated.

13-1.06 WORK BY CONTRACTOR

The Contractor shall perform all work as shown on the contract plans and as directed by the State's Engineer

13-1.07 LEGAL RELATIONS

The provisions of this section covering "RELATIONS WITH RAILROAD" and the provisions of the following section, "RAILROAD PROTECTIVE INSURANCE," of these special provisions shall inure directly to the benefit of the RAILROAD.

SECTION 13-2 RAILROAD PROTECTIVE INSURANCE

The term "RAILROAD" shall be understood to mean the San Diego Metropolitan Transit Development Board (MTDB), San Diego & Arizona Eastern (SD&AE) Railway Company and the San Diego Trolley, Inc. (SDTI).

Contractor agrees to release RAILROAD from any liability arising out of contractor's operations under this Contract. Furthermore, Contractor agrees to assume responsibility for any damages caused by reasons of Contractor's operations under this Contract and will, at RAILROAD's option, either repair or pay RAILROAD for such damage.

In addition to any other form of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the kinds and in the amounts hereinafter specified.

INSURANCE

A. Evidence Required:

During the performance of work hereunder, the Contractor and all subcontractors shall maintain policies of insurance as described below. Prior to beginning work, Contractor shall furnish evidence of insurance satisfactory to the Engineer and Railroad as to contents and insurance carriers which will contain a provision for thirty (30) days prior written notice to the Engineer and the RAILROAD of any cancellation, reduction, or any material change in coverage.

B. Insurance Required:

- (1) Comprehensive General Liability insurance for bodily injury (including death) and property damage which provides total limits of not less than five million dollars (\$5,000,000) combined single limit per occurrence. Coverage's included shall be:
 - a. Premises and operations;
 - b. Products/completed operations coverage which is to be maintained for three years following acceptance of work;

- c. Contractual liability expressly including liability assumed under this contract, with deletion of the exclusion as to performance of operations within the vicinity of any railroad bridge, trestle, track, roadbed, tunnel, underpass and crossways;
- d. Explosion, collapse and underground hazards;
- e. Personal injury liability with standard exclusions (a) liability assumed under contract and (c) suits brought by employees deleted;
- f. Independent contractors;
- g. Broad form property damage liability, and
- h. Cross liability clause providing that the insurance applies separately to each insured except with respect to the limits of liability.

Such insurance shall include the following endorsements, copies of which shall be provided:

- 1. Inclusion of the San Diego Metropolitan Transit Development Board (MTDB), San Diego Trolley, Inc., (SDTI) the San Diego & Arizona Eastern Railway Company (SD&AE), the San Diego Transit Corporation (SDTC) and the State of California Department of Transportation (State), their directors, officers, agents and employees as additional insured with respect to work or operations under this contract.
 - 2. Stipulation that the insurance is the PRIMARY insurance and that no insurance of MTDB/SDTI/SD&AE/SDTC/State shall be excess and noncontributory.
- (2) Comprehensive Automobile Liability Insurance for bodily injury (including death) and property damage which provides total limits of not less than five million dollars (\$5,000,000) combined single limit per occurrence applicable to all owned, non-owned and hired vehicles.
 - (3) Statutory workers' compensation coverage including a broad form all-states endorsement; employer's liability insurance for not less than five million dollars (\$5,000,000) per occurrence for all employees engaged in work or operations under this contract with insurer's waiver of subrogation in favor of MTDB/SDTI/SD&AE/State, their directors, officers, representatives, agents and employees.
 - (4) Contractor's equipment insurance on all "all risk" basis covering equipment owned, leased or used by Contractor. Such insurance shall include an insurer's waiver of subrogation in favor of MTDB/SDTI/SD&AE/State. Contractor hereby releases and holds harmless MTDB/SDTI/SD&AE State for loss or damage to his equipment.
 - (5) Statutory Workers' Compensation/Employer Liability coverage, including a broad form all-states endorsement; employer's liability insurance for not less than five million dollars (\$5,000,000) per occurrence for all employees engaged in work or operations under this Contract with insurer's waiver of subrogation in favor of MTDB/SDTI/SD&AE/State, their directors, officers, representatives, agents and employees.

C. Additional Coverage's Required:

- (1) Railroad Protective or Equivalent: Any exclusions relating to performance of operations within the vicinity of railroad, bridge, trestle, track, roadbed, tunnel, underpass or crossing must be deleted.
- (2) Option: Purchase separate Railroad Protective Insurance not less than five million dollars (\$5,000,000) combined single limit per occurrence.

D. Special Provisions:

- (1) The foregoing requirements as to the type and limits of insurance coverage to be maintained by Contractor, and any approval of said insurance by MTDB/SDTI/SD&AE/State or their insurance consultant(s) are not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by Contractor pursuant to this contract, including but not limited to the provisions concerning indemnification.

- (2) Should any of the work under this contract be sublet, Contractor shall require each of its subcontractor(s) of any tier to provide the aforementioned coverages, or Contractor may insure subcontractor(s) under his own policy(ies).
- (3) The insurance herein required shall be obtained by the successful bidder and two copies of evidence of insurance shall be sent to Mrs. Diane M. White, Right of way Agent of MTDB at 1255 Imperial Avenue, Suite 1000, San Diego, CA 92101-7490 who shall notify successful bidder if RAILROAD approves such insurance.

No work shall begin on RAILROAD right of way until such insurance has been approved by the Railroad.

SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____
2. Address of joint venture _____
3. Phone number of joint venture _____
4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

 - a. Describe the role of the MBE firm in the joint venture. _____
 - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

5. Nature of the joint venture's business _____
6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? _____
8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).
 - a. Profit and loss sharing.
 - b. Capital contributions, including equipment.
 - c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions _____

b. Management decisions, such as:

(1) Estimating _____

(2). Marketing and sales _____

(3). Hiring and firing of management personnel _____

(4) Purchasing of major items or supplies _____

c. Supervision of field operations _____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

| | |
|-----------------------|-----------------------|
| _____ Name of Firm | _____ Name of Firm |
| _____ Signature | _____ Signature |
| _____ Name | _____ Name |
| _____ Title | _____ Title |
| _____ Date | _____ Date |

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;

Section IV, paragraphs 1, 2, 3, 4, and 7;

Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
 - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
 - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall

include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
 - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
 - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
 - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
 - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
 - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
 - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
 - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
 - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
- a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized

representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

- a. Apprentices:
 - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
 - (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
 - (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different

practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or

part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof of the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing

apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

Notice To All Personnel Engaged On Federal-Aid Highway Projects

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is

not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

| | |
|---|-----|
| Goal for Women (applies nationwide).....(percent) | 6.9 |
|---|-----|

The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

| | | Goal (Percent) |
|------------|--|---------------------------|
| 174 | Redding, CA: | |
| | Non-SMSA Counties | 6.8 |
| | CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama. | |
| 175 | Eureka, CA | |
| | Non-SMSA Counties | 6.6 |
| | CA Del Norte; CA Humboldt; CA Trinity. | |
| 176 | San Francisco-Oakland-San Jose, CA: | |
| | SMSA Counties: | |
| | 7120 Salinas-Seaside-Monterey, CA | 28.9 |
| | CA Monterey. | |
| | 7360 San Francisco-Oakland | 25.6 |
| | CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo. | |
| | 7400 San Jose, CA | 19.6 |
| | CA Santa Clara. | |
| | 7485 Santa Cruz, CA. | 14.9 |
| | CA Santa Cruz. | |
| | 7500 Santa Rosa, CA | 9.1 |
| | CA Sonoma. | |
| | 8720 Vallejo-Fairfield- Napa, CA | 17.1 |
| | CA Napa; CA Solano | |
| | Non-SMSA Counties | 23.2 |
| | CA Lake; CA Mendocino; CA San Benito | |
| 177 | Sacramento, CA: | |
| | SMSA Counties: | |
| | 6920 Sacramento, CA | 16.1 |
| | CA Placer; CA Sacramento; CA Yolo. | |
| | Non-SMSA Counties | 14.3 |
| | CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba. | |
| 178 | Stockton-Modesto, CA: | |
| | SMSA Counties: | |
| | 5170 Modesto, CA | 12.3 |
| | CA Stanislaus. | |
| | 8120 Stockton, CA | 24.3 |
| | CA San Joaquin. | |
| | Non-SMSA Counties | 19.8 |
| | CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne. | |

| | | Goal (Percent) |
|------------|--|---------------------------|
| 179 | Fresno-Bakersfield, CA | |
| | SMSA Counties: | |
| | 0680 Bakersfield, CA | 19.1 |
| | CA Kern. | |
| | 2840 Fresno, CA | 26.1 |
| | CA Fresno. | |
| | Non-SMSA Counties | 23.6 |
| | CA Kings; CA Madera; CA Tulare. | |
| 180 | Los Angeles, CA: | |
| | SMSA Counties: | |
| | 0360 Anaheim-Santa Ana-Garden Grove, CA | 11.9 |
| | CA Orange. | |
| | 4480 Los Angeles-Long Beach, CA | 28.3 |
| | CA Los Angeles. | |
| | 6000 Oxnard-Simi Valley-Ventura, CA | 21.5 |
| | CA Ventura. | |
| | 6780 Riverside-San Bernardino-Ontario, CA. | 19.0 |
| | CA Riverside; CA San Bernardino. | |
| | 7480 Santa Barbara-Santa Maria-Lompoc, CA | 19.7 |
| | CA Santa Barbara. | |
| | Non-SMSA Counties | 24.6 |
| | CA Inyo; CA Mono; CA San Luis Obispo. | |
| 181 | San Diego, CA: | |
| | SMSA Counties | |
| | 7320 San Diego, CA. | 16.9 |
| | CA San Diego. | |
| | Non-SMSA Counties | 18.2 |
| | CA Imperial. | |

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 7.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.